COASTAL ZONE STRATEGIC PLAN

MINISTERIAL APPROVAL PAGE

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106-02222/

Dear Reader:

Re: Approval in Principle for the Coastal Zone Strategic Plan for the Central Coast

On behalf of Cabinet, I am pleased to announce approval in principle for this Coastal and Marine Strategic Plan for the Central Coast region.

This plan largely reflects the consensus reached by process participants on selected land and coastal resource management direction and accepted by government for the Central Coast. It also provides direction for further coastal planning to be undertaken at a more detailed level in priority areas.

Approved portions of this document will assist government agencies, the public, and stakeholder groups by providing a concise guide to future management and planning of coastal zone resources.

I wish to thank members of the LCRMP table, First Nations and provincial and federal agency representatives for their considerable dedication and effort in developing this interim plan document. I anticipate final approval of this plan after completing discussions with First Nations and federal agencies on outstanding issues.

The Honourable Stan Hagen
Minister of Sustainable Resource Management

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ACKNOWLEDGEMENTS

The preparation of this plan has been made possible by the dedication of a number of government agency, First Nations representatives and contractors. Special credit is due to John Bones, Andrew Hall, Mike Lambert, Duncan Williams, Rolf Schmitt, Joe Truscott, Don Howes, Mark Zacharias, Gord Enemark, Carol Ogborne, Fern Hietkamp, Dale Gueret, Alex Gzyrbowski and Rob Paynter.

GLOSSARY OF TERMS

Adaptive Management	The rigorous combination of management, research, and monitoring so that credible information is gained and management activities can be modified by experience. Adaptive management acknowledges institutional barriers to change and designs means to overcome them	
Alienation	A word used to define the act of issuing a lease, license, permit or other form of tenure over Crown land under the *Land Act*	
Aweenokola / Aweena gwees	All the traditional territories and resources of the member First Nations of the KDC/MTTC/T. Literal translation: "We are one with the land, sea and air we inherited."	
Bilge dumping	Discharge of water used as ship's ballast or as a consequence of bilge flushing	
Biological Diversity (*also* Biodiversity)	The variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems.	*UN Convention on Biological Diversity (1992), Canadian Biodiversity Strategy (Environment Canada, 1995)*
Blue listed species	Includes any indigenous species or subspecies (taxa) considered to be Vulnerable in British Columbia. Vulnerable taxa are of special concern because of characteristics that make them particularly sensitive to human activities or natural events.	*Conservation Data Centre*
Capability	The natural biological and physical ability of a given area of land to support a particular management activity or use (e.g., soil capability for agriculture; habitat capability for waterfowl). Capability is not concerned with social, economic, political or other such factors. Capability for individual uses is normally shown on land use capability maps that indicate the level to which various places are rated as having a capability to support the use in question.	DFO
Conservation:	The maintenance or sustainable use of the Earth's resources in a manner that maintains ecosystem, species and genetic diversity and the evolutionary and other processes that shaped them. Conservation may or may not involve the use of resources; that is, certain areas, species or populations may be excluded from human use as part of an overall landscape/waterscape conservation approach. (of Fish Habitats) The planned management of human activities that might affect fish habitat to prevent destruction and subsequent loss of fisheries benefits	*Environment Canada, 1996* *DFO*
Critical Marine Habitat	A marine/coastal area with biotic and/or abiotic conditions where the following three attributes co-exist: high ecological value, high sensitivity to disturbance; and high vulnerability to existing or potential stress	*Defining Critical Marine Habitat Discussion paper: LUCO*
Cultural Heritage Resource	An object, a site or the location of a traditional societal practice that is of historical, cultural or archaeological significance to the Province, a community or an aboriginal people. Cultural heritage resources include archaeological sites, structural features, heritage landscape features and traditional use	*Forest Act*

	sites.	
Ecosystem:	Any unit that includes all of the organisms (i.e., the community) in a given area interacting with the physical environment so that a flow of energy leads to a clearly defined trophic structure, biotic diversity, and material cycles (i.e. exchange of material between living and non-living parts) within the system."	*Odum, in Cunningham, WP, et al (eds) 1994. Environmental Encyclopedia. Gale Research Inc., Detroit, MI. 1994*
Ecosystem Capability :	Threshold based on natural conditions and social preferences that determines the number and density of activities - ability to accommodate and assimilate a certain level of activity and which if exceeded results in degradation to the supporting natural system	
Ecosystem Integrity:	A condition where the structure and function of an ecosystem are unimpaired by stresses induced by human activity and the system retains resilience in that its biological diversity and supporting processes are likely to persist.	*Parks Canada,*
Ecosystem-based Management:	The management of human activities so that ecosystems, their structure, function, composition, and the physical, chemical and biological processes that shaped them, continue at appropriate temporal and spatial scales.	*Canadian Biodiversity Strategy, Environment Canada, 1995*
Endangered	Endangered taxa facing imminent extirpation or extinction	*Conservation Data Centre*
First Nation	An independent, autonomous Nation that has a defined traditional territory, a governing system and culture and language of its own.	
Fish	Includes a) parts of fish; b) shellfish, crustaceans, marine animals and any parts of shellfish, crustaceans or marine animals; and c) the eggs, sperm, spawn, larvae, spat and juvenile stages of fish, shellfish, crustaceans and marine animals	*(Federal Fisheries Act, sec2)*
Fish Habitats	Spawning grounds and nursery, rearing, food supply and migration areas on which fish depend directly or indirectly in order to carry out their life processes	*Federal Fisheries Act, sec. 34(1)*
Gvilas	Literally, "The way we are, the way we should be." The economic, social and political structure of Heiltsuk society based on the system of laws and traditions centred on Heiltsuk chieftainships	
Habitat	The place where an organism lives, and/or the conditions of that environment, including the soil, vegetation, water and food. Habitat for various organisms may be classified in terms of its quality or importance and mapped to assist in land use allocation and management decisions.	
Industrial Minerals	Naturally occurring materials, including stone and rocks, used to build structures or supply products that are useful to society. Industrial minerals include abrasives but exclude the ores of metals, gems and art objects.	*Minerals Tenure Act*
Integrated Management	An ongoing and collaborative approach, which brings together interested parties to incorporate social, cultural, environmental, and economic values in the development and implementation of comprehensive plans and management processes for terrestrial, coastal, estuarine and marine areas	Adapted from DFO Working Group on Integrated Management
Kwakiutl	The KDC is a political organisation representing nine First Nations in the LCRMP process. Many of the KDC	

District Council (KDC)	member First Nations are located on the north-eastern end of Vancouver Island and all have traditional territories in the South Plan Area. The member First Nations of the KDC participating in this CCLCRMP include Kwakiutl, Mamaleleqala-Qwe-Qwa Sot-Enox, Da 'naxda' xw, Gwa Sala 'Nakwaxda' xw, Tlatlasikwala, We Wai Kai, We Wai Kum, Kwiakah and Comox.	
Laxwa	The source of Heiltsuk strength the source of the identity and legitimacy of Heiltsuk society centred on the streams, rivers, seas and lands controlled by the institution of Heiltsuk chieftainship.	
Local residents	Individuals, businesses and organisations whose primary residences or places of business are within the CCLCRMP Plan Area	
Marine Environmental Quality	An overall expression of the structure and function of the marine ecosystem taking into account the biological community and natural physiographic, geographic and climatic factors as well as physical and chemical conditions including those resulting from human activities."	(Skjoldal, 1999)
Marine Sensitive Zones	Marine areas identified under FPC, with values that are sensitive to impacts from logging activity. Because salmonids and other natural resources listed in the regulations occur in estuaries, the seaward portion of an estuary that does not meet the definition of stream is protected as a marine-sensitive zone (MSZ). For the purposes of the *Forest Practices Code of British Columbia Act* Operational Planning Regulation it includes herring spawning areas, shellfish beds, coastal marshes, aquaculture sites, juvenile salmonid rearing areas and adult salmon holding areas.	Forest Practices Code Fish-stream Identification Guidebook *Ministry of Forest Glossary*
Mitigation	Actions taken during the planning, design, construction and operation of works and undertakings to alleviate potential adverse effects on the productive capacity of fish habitats	*DFO Policy for the Management of Fish Habitat, 1986*
More Detailed Land Allocation Plan	A plan developed, generally at a scale of 1:5,00 to 1:125,000 containing land designation or zoning maps with an indication of permitted uses/activities and/or management/development requirements for land and resources	
Musgamagw Tsawataineuk Tribal Council (MTTC)	The MTTC is a political organisation representing three First Nations in the CCLCRMP process. All of the member First Nations have traditional territories that are located within the South Plan Area. The member First Nations of the MTTC participating in this CCLCRMP are: 'Namgis, Tsawataineuk and Kwicksutaineuk.	
Navigable Waters Protection Act (NWPA)	The NWPA is administered by the Coast Guard ensures that works in navigable waterways are approved and regulated so that the impact on navigation is minimized. It also includes provisions for the removal of unauthorized works or obstructions to navigation. The construction or modification of any work in, on, over, under through or across any navigable waterway (e.g. wharf, dock, pier, dam, boom, bridge, overhead cable, pipeline), requires authorization under NWPA.	*Authorizations for Works on Navigable Waterways; Navigable Waters Protection Program.* Canadian Coast Guard, DFO.
No Net Loss	A working principle by which Fisheries and Oceans Canada strives to balance unavoidable habitat losses with habitat replacement on a project-by-project basis so that further reductions to Canada's fisheries resources due to habitat loss or damage may be prevented	*DFO Policy for the Management of Fish Habitat, 1986*

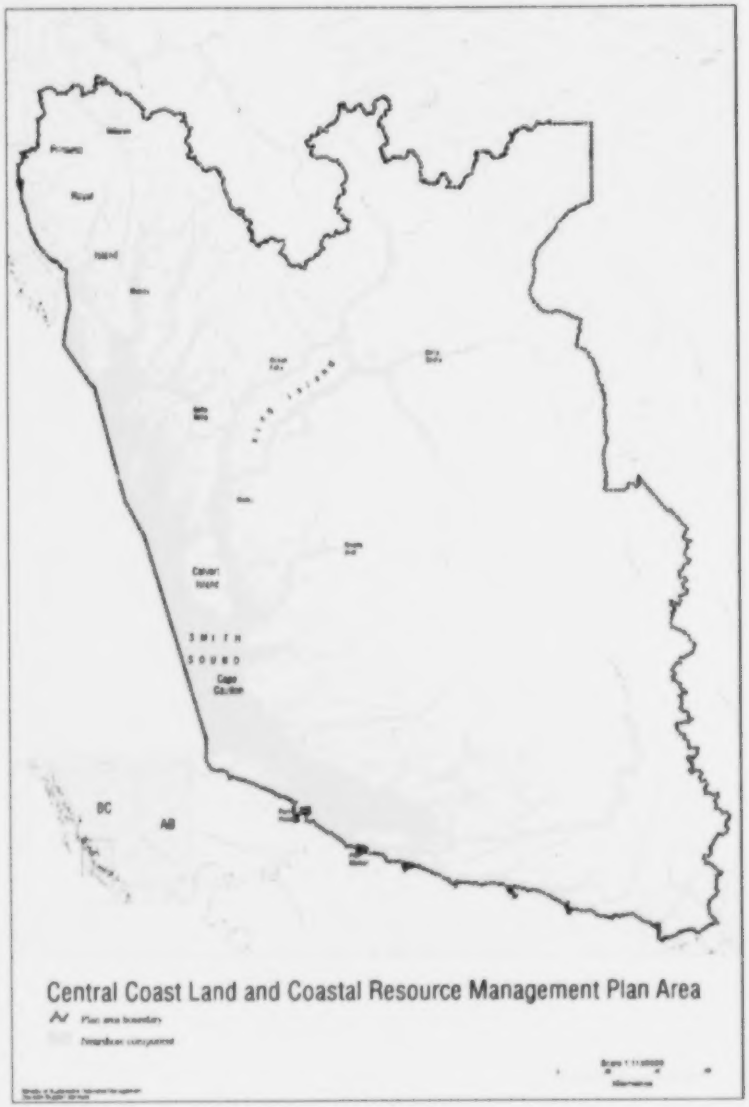
Nuyims	Oral history of a First Nation. Literally translated this means the story of Aweenokola Aweena gwees"	
Ocean Disposal	The deliberate disposal at sea of approved substances from ships, aircraft, platforms or other structure. Primarily these substances are dredged sediment or excavated native till from land, stream or marine sources. Ocean disposal may include disposal of fish waste, vessels, aircraft, platforms or other structures and disposal of substances on ice, although these types rarely occur in the Pacific region. Environment Canada administers the Ocean Disposal Program through a permitting process under authority of the *Canadian Environmental Protection Act*, which prohibits the ocean disposal of substances which may be harmful to the marine environment. The disposal of hazardous wastes in Canadian marine waters is prohibited.	Please refer to http://www.pyr.ec.gc.ca/ep/ocean-disposal/fact2.htm for more details and map
Point Source Discharge	Emission or effluent released into the environment from a discrete source (i.e. smokestack, outfall)	
Precautionary Approach	The Precautionary Approach combines the need to be proactive, management based on reference points and risk averse decision making along with other elements in a formal operational framework for decision making. The FAO recommends that "*states should apply the precautionary approach widely to conservation, management and exploitation of living aquatic resources in order to protect them and preserve the aquatic environment. The absence of adequate scientific information should not be used as a reason for postponing or failing to take conservation and management measures.*"	*(FAO, Code of Conduct 1995).*
Productive Capacity	The maximum natural capability of habitats to produce healthy fish, safe for human consumption, or to support or produce aquatic organisms on which fish depend	*DFO Policy for the Management of Fish Habitat, 1986*
Protection	A state in which subject land or resources are protected from certain human activities or natural occurrences; prescribing guidelines and conditions, and enforcing laws for the purpose of preventing the harmful alteration, destruction or disruption of an identified resource value Protection (of fish habitats) prescribing guidelines and conditions, enforcing laws for the purpose of preventing the harmful alteration, disruption or destruction of fish habitat	
Protection Area	An area within which a specified range of activities is not permitted in order to preserve an identified set of values. Includes, but is not limited to provincial parks, ELUC designated reserves, Land Act Reserves	
Protocol	A process (as defined by the First Nation) of informing, seeking the support of, and addressing issues and concerns identified by First Nations concerning resource development proposals to the mutual satisfaction of the First Nation and the Province.	
Red listed species	Includes any indigenous species or subspecies (taxa) considered to be Extirpated, Endangered, or Threatened in British Columbia.,	
Remediation	Action to eliminate, limit, correct, counteract, mitigate or remove any contaminant or the negative effects on the environment or human health of any contaminant	*Waste Management Act*
Restoration	The return of an ecosystem or habitat to its original community structure, natural complement of species	*Ministry of Forests Glossary of Terms*

	and natural functions. Restoration (of fish habitats) the treatment or clean-up of fish habitat that has been altered, disrupted or degraded for the purpose of increasing its capability to sustain a productive fisheries resource	*DFO Policy for the Management of Fish Habitat, 1986*
Sacred Place	Considered to be a subset of traditional Use Sites; geographically defined site that may lack physical evidence of human made artefacts or structures but retains a cultural significance to a living community of people	*MSBTC: Archaeological Branch draft*
Sensitive Coastal Nearshore Fish Habitat	Include but are not limited to surf grass/eelgrass, rock reef habitats, bull and giant kelp beds, intertidal salt marshes, coastal areas used by salmonids as migration routes, rearing habitat, areas supporting significant fish populations (including Dungeness crabs, urchins, herring, lingcod/greenling, true cod, soles and flounders, rock fish, cabezone or sea perch), significant hardshell clam populations and areas commonly used by marine mammals	
Sensitive Habitat	A larger area used by a plant or animal species, which if altered or damaged by human activity, would result in increased stress or dislocation but not the loss of dependent species	
Species activity window	A period of the month or year during which species, primarily marine, are more vulnerable to impacts from human activities, i.e. anadromous fish migration. Also refers to timing of sensitive life stages	
Suitability	The ability of land and water to accommodate various human uses and activities as well as ecosystem functions, based on social choice and economic preferences in addition to natural capability	
Sustainability	A state or process that can be maintained indefinitely. The principles of sustainability integrate three closely interlined elements—the environment, the economy and the social system—into a system that can be maintained in a healthy state indefinitely	*Ministry of Forests Glossary of Terms*
Tlowitsis (T)	An independent First Nation not belonging to either the KDC/MTTC Tribal Councils but has traditional territories within the South Plan Area. The Tlowitsis Nation is connected linguistically and culturally to the member First Nations of the KDC/MTTC .	
Traditional Ecological Knowledge	A body of knowledge built up by a group of indigenous people through generations of living in close contact with nature. It includes a system of classification, a set of empirical observations about local environment (often referred to as "the land"), and a system of rules or ethics that governs human behaviour and use of resources. The quantity and quality of traditional environmental knowledge varies among community members, depending upon gender, age, social status, etc.) With its roots firmly in the past, traditional environmental knowledge is both cumulative and dynamic, building upon the experience of earlier generations and adapting to socio-economic and environmental changes and adopting useful aspects of modern technological innovation." (h)	*From Johnson, Martha and Robert Ruttan. 1993. Traditional Dene Environmental Knowledge, A Pilot Project Conducted in Ft. Good Hope and Colville Lake NWT, 1989-93. Dene Cultural Institute. Hay River, NWT. Pages 8-9*
Traditional territory	Throughout this document, the term is used by the province to refer to the area of land and water to which a First Nation asserts title or traditional use or occupation.	

ABBREVIATIONS/ACRONYMS

BCAL	BC Assets and Lands Corporation
BC Fsh	BC Fisheries (a component of MAFF)
BTM	Baseline Thematic Mapping
CDC	Conservation Data Centre
CHRIS	Cultural Heritage Resource Inventory System
CRII	Corporate Resource Inventory Initiative
ESA	Environmentally Sensitive Areas
FOC	Fisheries and Oceans Canada, federal department (also DFO *obsolete:* Department of Fisheries and Oceans)
FPC	Forest Practices Code of British Columbia Act
GIS	Geographic Information System
HLP	Higher Level Plan (under Forest Practices Code)
IAMC	Inter-Agency Management Committee
IPT	Inter-Agency Planning Team
LRMP	Land and Resource Management Plan
LUCO	Land Use Coordination Office (now part of MSRM)
MAFF	Ministry of Agriculture, Fisheries and Food
MEM	Ministry of Energy and Mines
MoF	Ministry of Forests
MSRM	Ministry of Sustainable Resource Management
MSZ	Marine Sensitive Zone
MWLAP	Ministry of Water, Land and Air Protection
PAS	Protected Area Strategy
RIC	Resource Inventory Committee
RPAT	Regional Protected Area Team
SEA	Socio-Economic Analysis
TEM	Terrestrial Ecosystem Mapping
TOR	Terms Of Reference
TRIM	Terrain Resource Information Management
WHA	Wildlife Habitat Area
WMA	Wildlife Management Area

CENTRAL COAST LAND AND COASTAL RESOURCE MANAGEMENT PLAN
PLAN AREA



1.0 PLAN AREA DESCRIPTION

The coastal component of Central Coast Plan Area extends from Princess Royal Island in the north to Southern Johnstone Strait in the south. It comprises approximately 1.1 million hectares of nearshore (saltwater) area.

The boundaries of the Plan Area reflect a combination of ecological, administrative and First Nations traditional territory boundaries. Marine planning units are based upon the BC Marine Ecological Classification developed by the Land Use Coordination Office (now in MSRM). These units have been identified on the basis of the following physiographic and oceanographic properties: wave exposure, depth, subsurface relief, currents and substrate. (refer to Map 2)

1.1 ENVIRONMENT & VALUES

1.1.1 ECOSECTION AND BIOGEOCLIMATIC ZONES

Those coastal areas most affected by oceanic conditions and, in the Plan Area are included within the Queen Charlotte Sound Ecosection. The more sheltered waters of mainland fjords and inlets comprise the North Coast Fjords and Johnstone Strait Ecosections. The Queen Charlotte Strait Ecosection represents a transitional area with significant marine characteristics but is more sheltered from the open ocean than the Queen Charlotte Sound. (refer to Map 3)

> *Effective representation of coastal and marine ecosystems will, as a minimum, require suitable examples representing the characteristics of the Queen Charlotte Sound and Johnstone Strait ecosections*

1.1.2 Water

The prevailing wet climate of the Central Coast translates to large volumes of water on mountain slopes, due to heavy rainfall or heavy rainfall on melting snow. Most rainwater moves through the forest soil, with rapid runoff during heavy rains. Rapid drainage through forest soils on steep slopes contributes to slope stability, and landslides often occur where drainage is altered or impeded. Deposition of this nutrient laden sediment has resulted in the formation of numerous estuaries throughout the Plan Area and contributes to the high productivity levels of nearshore coastal waters

> *Upland activities can result in short and long term ecological impacts to estuaries and coastal nearshore waters due to sedimentation, increased nutrient discharge and turbidity from streams*

1.1.3 Coastal and Marine Habitat

In the same manner that the upland environment varies considerably from coastal areas into the interior, coastal and marine habitats of the Central Coast run the gamut from high energy ocean conditions to sheltered fjords. Coastal, nearshore habitats that are generally considered to have the highest ecological significance are estuaries, salt marshes, sea grass beds and tidal flats, canopy kelp beds, subtidal rocky reefs and localised nutrient-rich upwelling areas. Estuaries and associated salt marshes, sea grass bed and tidal flats are located throughout the Plan Area at the heads of mainland inlets. Estuaries are some of the most highly productive habitats in the coast zone. While estuaries

typically have a low diversity of planktonic and benthic species that can tolerate fluctuating salinity regimes, those species that are present tend to be abundant. Wildlife and fish species are attracted to this abundant food source and the shelter from the surrounding lands.

Intertidal and shallow subtidal rocky reefs provide a highly complex bottom type that is important for commercial groundfish such as lingcod and some rockfish. They also provide a diverse habitat for micro- and macro-algae, benthic invertebrates and many species of non-commercial fish. Reefs include areas with hard rock bottom with complexity created by the presence of rocky outcrops often surrounded by boulders and/or cobble. Based on the coastal geology and maps of bathymetry, the highest concentrations of these reefs to be found are along the outer coast of Queen Charlotte Sound (Planning Units C5, 6 and 10)[1] and in Queen Charlotte Strait (Planning Unit C13) around the Broughton Archipelago and from Nigei/Gordon Islands across to the Deserters and Walker Group.

Canopy kelp beds are generally located along exposed and semi-exposed coastlines and in areas of upwelling or high current channels where nutrient levels are high and a rocky substrate is available. The kelp fronds are attached by a "holdfast" to rocky substrates and grow from the zero tide level, or just above, to about minus 12 metres depending on the water clarity. Kelp may grow on unstable substrates such as cobble but beds tend to be more ephemeral in such areas. The ecosystems associated with canopy kelp beds are highly productive and provide important habitats for many fish and invertebrate species including spawning herring..

The area of Hakai Pass to the Bardswell group (C5) has been of particular interest because of the high standing crop of kelp and the significance of the kelp in rebuilding populations of sea otters. This area is partly contained within the Hakai Recreation Area. Other extensive stands of canopy kelp that have been surveyed in the planning region are three areas located within Planning Unit C13: Malcolm Island, the north end of Vancouver Island, and the Estevan Group.

Areas of interest for special management and/or protection/preservation from alteration include estuaries (located throughout Plan Area), rocky reefs (esp. C5, C6, C10, C13) and kelp 'forests' (esp. C5).

1.1.4 Fish and Marine Plants

Fish producing systems within the plan area range from larger rivers like the Bella Coola/Atnarko, Klinaklini River and the Kilbella River that have over 100 kilometres of fish presence, to small tributary systems with less than 1 kilometre of known fish habitat. There is a total of 3,237 kilometres and 3,039 kilometres of known fish presence (exclusive of numerous undocumented small and/or isolated systems) in the North and South Plan Areas, respectively. The North and South Plan Areas have approximately of 540 and 150 known salmon-producing systems, respectively.

In the southern Plan Area, biophysical limits to fish production include cold thermal regimes, low dissolved nutrient levels, glacial silt loading and a short growing season. Streams flowing through in steep-sided, heavily glaciated valleys result in extremely rapid response to rainfall or snowmelt and flash floods. Freshets extend through September in many systems and waters are clouded by rock flour. Streams have extremely soft, low conductivity water. In addition, periodic flood events combined with bank erosion, substrate instability, sand and silt

[1] Refer to Appendix IV for more detailed descriptions of these planning units

deposition and debris torrents further limit fish production. A lack of productive stream lengths due to barriers also influences the productive capacity of streams within the Plan Area.

Eulachon is an anadromous species, spawning in rivers and migrating offshore to feed for 2 to 5 years before returning to spawn. In BC, they spawn from mid-March to mid-May, mainly in large mainland rivers and a few rivers of intermediate size. Eulachon are culturally important species and highly regarded as a food fish by First Nation people. Eulachon adults also play an important role in the food chain, providing a food source for halibut, cod, sturgeon and dogfish as well as whales, porpoises, seals, sea lions and marine birds. Young eulachon larvae and post-larvae contribute to the food source of juvenile salmonids and cod species, particularly when congregated in major estuaries. Nine primary eulachon-producing systems are present in the Plan Area; all known spawning rivers have distinct spring freshets, and most have glacial headwater areas. In recent years, a marked decline in runs has been noted. While both shifts in climatic regime and bycatch issues have been suggested, a definitive factor has yet to be determined for the decline

There is a growing perception that anadromous fish are "cornerstone" species, in that they provide the resource base to support much of the Pacific coastal ecosystem, linking the ocean, freshwater and land. The productivity of freshwater and riparian ecosystems is in part fuelled by marine-derived nutrient subsidies from anadromous (including eulachon) and inshore-spawning (herring, sand lance) fishes. Most salmon die after spawning, and their carcasses provide substrate and food for a rich community of algae, fungi, and bacteria, which in turn supports increasing populations of invertebrates, which then serve as food for fish in the stream, including juvenile salmon. Furthermore, the predators that feed on living and dead fish can mediate aquatic to terrestrial nutrient fertilization. Animals such as eagles, ravens, crows, river otters, and most significantly bears commonly haul salmon onto stream banks, then several metres back into the forest. Trees and other plants can then take up the nutrients (such as nitrogen and phosphorus), and probably pass them up the food chain to animal consumers.

Information on marine invertebrates, as well as fish tends to be limited to those of commercial value. These marine invertebrate of commercial interest include: sea urchins, sea cucumbers, crab, prawn/shrimp, clams, geoduck, abalone, squid, and octopus. Sea urchins are found primarily on rock bottoms in the lower intertidal and shallow subtidal water throughout the Plan Area. Sea cucumbers are a common, widespread invertebrate throughout the coast of BC on bedrock stubstrates in areas of little or no current. They are also found on sand, gravel or mud bottoms and often in eelgrass beds.

Marine fish species include pelagic species which spend most of their adult life in the water column, generally in large schools - herring, pilchard (Pacific sardine), smelt, sandlance, rockfish, and the ground fish - Pacific halibut, other flatfish, walleye pollock, Pacific cod, Pacific hake, lingcod, and sablefish. Groundfish fisheries within the Plan Area are generally located in offshore areas of Queen Charlotte Sound and Queen Charlotte Strait. There are at least 35 species of found in BC coastal waters. For management purposes, they are divided up into "inshore", "shelf" and "slope" species. The maximum life span of species is estimated at 20-140 years depending on the species.

Harvesting of marine resources extends to marine plants, such as the spawn on kelp fishery.

The Plan Area is host to a wide range of ecologically important and economically significant marine species which have a range of environmental needs and varying sensitivities to human activities

1.1.5 Marine Mammals & Birds

There are three groups of marine mammals present in the coastal waters of the Plan Area; the sea otter, pinnipeds (seals and sea lions), and cetaceans (porpoises, dolphins and whales). Cetacean (whale, dolphin and porpoise) species are very mobile and there is limited sighting data for most species in the Plan Area. The distributions of the more common whale species have been mapped using habitat models based on water depth range and distance from shore preferences, and sighting information where available. The rubbing beaches of Robson Bight Park (C15) are internationally recognised for their concentrations of Orcas (Killer whales).

The Marbled Murrelet was listed as an endangered species in Canada in 1990 mainly because of loss of nesting habitat, but also because of fishing-net mortality and the threat of oil spills. Marbled Murrelets are red-listed (threatened or endangered) provincially. Within the Central Coast planning area Marbled Murrelets are mostly concentrated in the area of Princess Royal Channel and the associated fjords (C1), and Millbank Sound and the associated complex of Spiller-Matheson Channel (C3, C4 and C5). High concentrations have been observed in Kynoch and Mussel Inlets at the end of Mathieson Channel in Fjordland Recreation Area. The main overwintering sites in the vicinity of the planning area are located in Desolation Sound and the south end of Discovery Passage (just south of C15).

Cassin's Auklet is the most numerous alcid breeding on the coast of British Columbia. Cassin's Auklet is blue-listed provincially. There are about 6,815 breeding pairs at 5 sites within the Plan Area; ~6,000 of these pairs make up the colony on the Buckle group in the entrance to Queen Charlotte Strait (Planning Unit 13). Cassin's Auklets are very sensitive to disturbance during the nesting period.

There are about 162,240 breeding pairs of Rhinoceros Auklets within the Plan Area (72% of the BC population); 150,000 of these pairs are on the Pine and Storm Islands in the Duke of Edinburgh Ecological Reserve at the entrance to Queen Charlotte Strait (Planning Unit 13). There are not many colonies of Rhinoceros Auklets in North America and most of the large ones are in British Columbia.

"Tube-noses", bird species of the Order *Procellariiformes* spend most of their lives at sea, coming ashore only to nest.. In the Plan Area species which are found include the great albatrosses, shearwaters and the swallow-like storm petrels. Only the two storm petrel species breed in the Plan Area: Fork–tailed Storm Petrel and Leach's Storm Petrel. Within the Plan Area there are an estimated 60,000 pairs of Fork–tailed Storm Petrels at three known sites and 275,000 pairs of Leach's Storm Petrels at five known sites. The colonies on these islands represent a significant portion of the Canadian, and the global Fork-tailed and Leach's Storm Petrels. The colony on Storm Island is the largest known colony in BC for both species. The colonies are all included in the Duke of Edinburgh Ecological Reserve (C13) which has been designated an "Important Canadian Bird Area" for this reason. Like most sea birds, storm petrels have relatively long life spans (up to 24 years or more) and low mortality rates for their size.

These species and the six other species of *Procellariiformes* commonly found within the Plan Area tend to be most numerous within BC waters from April through September. All of the species tend to concentrate over offshore areas such as banks and areas of upwelling. The most important areas of concentration within the Plan Area are in the waters around Goose and the Gosling Islands and over the adjacent Goose Island Bank (C4 and C5) and at the entrance to Queen Charlotte Strait (C10 and C13). They tend to be mostly found offshore of the 70 to 140 m contour out to the edge of the continental shelf forming loose groups or individually.

The Glaucous-winged Gull is widely distributed along the BC coast and is found in all coastal habitats in all seasons. Within the Plan Area colonies are concentrated along the outer coast in Planning Units C5, 10 and 13; the main areas of concentration are at the entrances to Rivers and Smiths Inlets. There are also three small colonies in Planning Unit 15.

Most shorebirds are migrants or winter visitors to the coastal portions of the planning area. The spring migration is concentrated into the months of April and May while the fall migration is spread out from mid-June to October, depending on the species. The sites used by migratory shorebirds are concentrated along the outer coast areas that protrude into Queen Charlotte Sound (C5 and C10). The preferred habitats for migratory shorebirds are sloping beaches, intertidal flats and estuaries. Most of the known sites used by shorebirds in the planning area are remote and currently have minimal human disturbance. An increase in human activity at these sites could affect migratory shorebirds.

Three species of cormorant are found within the Central Coast planning area. The Pelagic Cormorant is the only species to breed in the area and remain there year-round. Groups of up to 40 birds have been sighted along the shores of Queen Charlotte and Johnstone Straits; generally lower numbers are found in the north Plan Area, typically in the sounds and channels. Brandt's Cormorant is restricted to the Pacific coast of North America and is migrant along the outer portions of the Central Coast Plan Area. The species does not breed or over winter within the Plan Area. Brandt's Cormorant is red-listed provincially (endangered or threatened).

All 24 of the most common water fowl and divers occurring in the Plan Area breed primarily in interior regions and use coastal locations during spring and/or fall migrations or for the entire non-breeding period from September to mid-May. Three species of diving ducks, Harlequin Ducks, Surf Scoters and White-winged Scoters may move to marine waters during the late summer (July-August) to areas with high food abundance during the post-breeding moult. Loons may use the marine coastal waters during the summer and dabbling ducks, geese and swans can be found in estuaries near breeding sites.

There are no major waterfowl breeding grounds within the Plan Area. Compared to other regions of the province, the Central Coast coastal planning area is not generally an area of "prime" importance to waterfowl or divers. There are no areas within the marine region of the Central Coast plan area that have been identified as critical waterfowl habitat for BC although some areas have been identified by CWS as "Areas of Interest" based on use by local waterfowl populations. Notably the estuaries at the heads of some of the inlets and channels support locally important waterfowl populations. There are numerous sites in the sheltered areas of the mainland inlets and archipelagos that are also used as wintering habitat for sea ducks. Planning Units C9 (Rivers Inlet) and C16 (Knight Inlet) have the highest percentage of good waterfowl habitat in the Plan Area.

Along the outer coast there are a number of sites that are used by post-breeding moulting sea ducks in late-July and August. It is thought that some of these sites may be traditional "moulting areas" that are used every year by the same population. Moulting concentrations of both Surf scoters and White-winged scoters have been observed within the plan area; there are currently six known sites; Darby Channel, Egg Rocks, Fitz Hugh Sound, Spider Island, (C10) Rivers Inlet (C9) and Troup Passage.

Areas of interest for bird habitat are located in C1,C3, C4, C5, C9, C10, C13,C15, C16. Duke of Edinburgh Ecological Reserve in Queen Charlotte Strait has been designated an "Important Canadian Bird Area".

1.1.6 Energy and Minerals

There is considerable potential for extraction of oil and natural gas off of the Central Coast in Queen Charlotte Sound and Hecate Strait. The Geological Survey of Canada estimates that the range of resource potential is 6.3 to 19.4 billion barrels (bbls.) of "in-place" oil and 12 to 48 Trillion Cubic Feet (TCF) of "in-place" gas. This, according to Ministry of Energy and Mines staff, is about 10 times as much oil and one-third as much gas as exists in north-east BC. Currently, most of the area from the northern tip of Vancouver Island to Dixon Entrance is covered by exploration licenses. There is currently a government moratorium on off-shore exploration and development.

There is potential for significant oil and gas development in the offshore area and potential for coal-bed methane extraction in Johnstone and Queen Charlotte Straits

1.2 Present Land and Resource Use Pattern

1.2.1 First Nations Uses

First Nation people have a long history within the Plan Area, and maintain a high dependence on the natural resources of their traditional territories. Marine resources in particular have provided both sustenance and served as the basis for trade for millennia. Coastal First Nations made use of a network of "grease trails" to transport eulachon grease for trade with First Nations of the Interior.

Most marine resources in the area have historically been utilised in some capacity by local First Nations. In the past, economic stability was achieved by commercial participation in local fisheries. By participating in a number of fisheries, it was possible to accomplish sustainable employment for the entire year. Over time however, management changes such as the introduction of individual quotas and license limitation programs have required that fishermen concentrate their efforts towards individual species and gear their vessels accordingly.

Although numbers have declined recently due to economic concerns in the resource industry, in 1996, about 30% of the on-reserve labour force were employed in the fishing and forestry industry.

First Nations of the Central Coast have long relied upon coastal and marine resources for subsistence and economic stability. Restructuring of fishing by DFO has resulted in reduced economic opportunity for a wide segment of First Nation residents of the Central Coast.

1.2.2 Fishing

Commercial fishermen harvest over 80 different species including salmon, herring, groundfish, and shellfish using, depending on the target, a variety of nets (seine, gillnet, trawl), hooks and lines (troll, longline), traps, diving techniques or other gear throughout the Central Coast.

Although fisheries management is not a subject for this Coastal Zone Plan, it is recognised that commercial and subsistence fishing are a key element in the economic fabric of central Coast communities

1.2.3 Aquaculture

The Central Coast is home to the majority of the province's 121 salmon farm tenures, which are operated by 12 companies. There are 68 aquaculture tenures involving 4 companies and 1 First Nation in the Plan Area, but not all of these sites are actually occupied by farms for a variety of reasons, including unsuitable locations, and the standard fallowing practices. Only 2 of these existing tenures with their accompanying salmon farms are found in the Northern portion of the Plan Area, but 2 additional salmon farm applications are pending in this area due to their relocation from the South Coast Area. The industry has also expressed some interest in the Rivers Inlet area, should the province allow future new development.

Of the existing farms, 63 currently produce Atlantic salmon (Atlantic, Chinook, and coho) and 5 produce shellfish (Pacific oyster, Manila clams and Japanese scallops). The salmon aquaculture tenures are currently held by the following entities: Stolt Seafarms (25), Heritage Aquaculture (11), the Omega Salmon Group (23), Marine Harvest Canada (2) and the Kitasoo first Nation (2 tenures held by the Kitasoo with joint ventures at these farms with Marine Harvest Canada).

In response to increasing questions from the public about the potential impact of the industry on the marine environment the BC government suspended issuance of new farm licences in 1995 and directed the Environmental Assessment Office (EAO) to review the adequacy of current provincial government methods and processes for regulating and managing salmon aquaculture. In the fall of 1999 the province announced a Salmon Aquaculture Policy Framework that essentially accepted the 49 recommendations of the EAO, capped the number of existing farm sites at 121 for two years and initiated 5 main processes to increase the sustainability of the industry. The future direction of salmon farming will be evaluated in the fall of 2001 based on industry's compliance with the new environmental standards, technological development and consultation with coastal communities.

> *Aquaculture is a potential economic generator for small, isolated coastal communities. However, salmon aquaculture, and specifically Atlantic Salmon aquaculture, does not enjoy universal support as debate continues over its environmental impacts. Relocation of existing sites now in conflict with newly established siting criteria will be a significant implementation issue.*

1.2.4 Recreation & Tourism

The Central Coast has become one of the primary destination areas in the province. The spectacular and natural setting attracts large numbers of visitors annually to participate in a wide variety of activities. For example, in 1999, over 1 million visitors (cruise ship traffic) travelled by the Central Coast en route to Alaska and 9500 passengers travelled BC Ferries' Discovery Passage Route from Port Hardy to Bella Coola. The Central Coast has had a long history of both marine and land based tourism and recreation use. The remoteness, beauty, and spectrum of sheltered waters to rugged exposed coasts provides for a range of tourism and recreation interests. Coastal travel and access depends on helicopters, kayaks, canoes, and luxury yachts.

While there are key "destination" areas, there is much growth and tourism in the far and remote reaches of the area. With the "boomers" coming on-line, soft adventure relying on comfortable lodges and reliable transportation will see significant growth. As "wild land" declines globally, there will also be growth in non-mechanised activities such as sea kayaking and hiking. There are a number of key areas at the

moment including Rivers Inlet, Seaforth Channel, Hakai Recreation Area, Broughton Archipelago, Knight Inlet, and Sonora Island. These areas see significant use from fishers, pleasure cruisers, wildlife viewers, kayakers, floatplanes, and helicopter sightseers.

Wildlife viewing of both marine and terrestrial mammals is in activity on the increase. Bird watching is also increasing and is considered the number one activity in the USA.

Of the 50 sport fishing lodges in the Plan Area, over half are owned or operated by non-residents of the Central Coast. An estimated 42 saltwater charter companies operate in the Central Coast area (some of which also offer viewing and other services). Of these known charter operators, five are based in the region.

> *There is considerable potential for growth in tourism. The Broughton Archipelago and the Hakai area are currently the top two destinations for marine tourism in the province. The majority of activities are reliant upon air or water access. Eco-tourism and many recreational activities currently occurring within the Plan Area rely heavily on the pristine quality of the environment; industrial development can impact the wilderness experience considerably. Tourism does experience seasonality in demand and may not provide sufficient year round employment activities to be considered an economic mainstay.*

1.2.5 Economic Activities

Natural resource activities, primarily fishing, forestry, hunting, and trapping, have traditionally been the economic mainstay of the Plan Area, both for commercial and subsistence purposes. Downturns in the fishing and forest industries during the mid to late 1990s, further impacted a local economy experiencing a decline in forestry manufacturing. Nevertheless, between 1986 and 1996 economic and population growth was relatively strong for such a sparsely populated area, in spite of the Plan Area's relative remoteness, minimal infrastructure, and lack of economic diversification.

Over 90% of the roughly 2200-member labour force is located in the northern portion of the Plan Area; between 1986 and 1996, the labour force in the north grew by about 40%, while that in the south remained relatively stable. Direct fishing (primary & manufacturing) was estimated at about 200 (approximately 11% of the resident labour force). Employment in this resource sector has been much more volatile (reflecting both cyclical and structural changes) than that in the service sector, which has demonstrated consistent growth from 1986-1996.

Almost half (1070 of 2190 workers) of the overall Plan Area resident labour force live on-reserve, with the pubic sector the single largest source of employment (45%). Fishing and fish processing employed about 19% of the on-reserve labour force in 1996, while Forestry employs 9% of the on-reserve labour force in 1996. While the Central Coast region is rich in resources a low proportion of both the extraction and processing jobs actually accrue to the local residents, due mainly to centralisation of fish and forest product processing elsewhere in BC. A significant proportion of residents, especially youth and First Nations, experience high unemployment characterised by seasonal fluctuations. With few employment opportunities available young people are discouraged from remaining in the area.

The unemployment rate in the overall Plan Area declined from 25% to 15% over the 1986 to 1996 term, reflecting the slow recovery from the economic recession in the early 1980's. However, unemployment appeared to worsen in the southern portion during this period. Both areas also experienced much higher unemployment rates than the 1996 BC average of 8.9%. Moreover, since 1996, the local economic situation

has deteriorated, primarily due to declines in the fishing and forestry sectors. It is likely that for most of the Plan Area, First Nations communities have unemployment rates exceeding 50%.

Based on information from the Mid Coast Forest District which approximates the northern portion of the Plan Area and accounts for most of the overall area's population and labour force - forestry, the public sector, tourism and fishing activities dominate the local economy. It is noteworthy that the contribution of the public sector (including salaries of government employees and transfer payments) was 45% of the total basic income in 1996, more than double that of the next largest sector (i.e., forestry) - this adds considerably to the economic stability in the area.

Fishing for and processing of commercial species has a long history in the Central Coast. Earlier in this century, there were a large number of fish packing/processing plants scattered on inlets throughout the region. However, with better refrigeration and the dominance of the large facilities/companies and their associated economies of scale, virtually all of the catch is now taken outside the Plan Area for processing. With the closure of the Namu and Shearwater facilities, by 1996 only three processing plants remained in the Plan Area: Bella Bella Fisheries in Bella Bella-, Kitasoo Seafoods in Klemtu and the smaller Bella Coola Valley Seafoods in Bella Coola. There is also a smoker plant owned by the Nuxalk in Bella Coola that operates intermittently. Commercial and recreational fishermen have benefited from salmon production under the Fisheries and Oceans Canada's *Salmonid Enhancement Program* (*SEP*) and several hatcheries have operated in the Central Coast area, e.g., the Snootli Hatchery of Bella Coola and the McLoughlin Hatchery near Bella Bella.

By 1997, Central Coast residents held 113 commercial salmon "A" licenses and 10 herring spawn-on-kelp "J" licenses. These licenses generated an estimated 289 seasonal jobs, with approximately 169 in salmon harvesting, roughly 60 in spawn-on-kelp harvesting, and up to 50 in local fish processing. In addition to harvesting and processing salmon, a variety of other fish and shellfish are also harvested for commercial and/sustenance purposes in the Plan Area including clams, crabs, spot prawns, geoduck, urchins, shrimp, scallops, octopus, and numerous types of groundfish. Sea cucumbers are currently under restrictive conservation management coastwide. The majority of these commercial fishery license holders who fish in the area do not live in the area.

The participation of Central Coast residents in the herring spawn-on-kelp fishery, a large proportion of who are aboriginal, is both substantial and evolving. Prior to 1997, Central Coast interests held 6 of the 39 licenses. As a result of the Supreme Court of Canada "Gladstone Decision", the Heiltsuk Band has acquired additional licenses (from 2 in 1996 to 6 in 1997 to 9 in 1998). By 1998, Central Coast interests held 13 of the 46 spawn-on-kelp licenses.

In 1996 economic dependency analysis tourism accounted for 16% of local resident basic employment and 10% of basic income in the Mid Coast Forest District portion of the Plan Area, which contains over 90% of the Plan Area population. The local tourism industry is very dependent on the area's high-quality outdoor recreation opportunities, in particular, sport fishing, marine touring, wildlife viewing, kayaking, and hunting. This dependence of the tourism industry on outdoor experiences is reflected in which summarises the region's key tourism facilities and services.

The sport fishing industry is the largest generator of tourism revenue in the Plan Area. According to the Ministry of Small Business, Tourism and Culture's Tourism Resource Inventory, there are a total of 50 fishing lodges (including both floating and land-based lodges) in the Plan

Area. These lodges cater mainly to affluent anglers willing to pay a daily all-inclusive rate of $400+ per day. Rivers Inlet, the Bella Coola River and other Central Coast areas are renowned for their large chinook and "northern" coho. Over half of these lodges are owned or operated by non-residents of the Central Coast. It is estimated that 42 saltwater charter companies operate in the Central Coast area. Of these known charter operators, five are based in the region.

Recent studies indicate that total salt-water sport fishing sales revenues (equivalent to angler expenditures) in the Plan Area totalled $20.4 million in 1994 and resulted in an estimated 160 seasonal jobs, of which 115 accrued to Central Coast residents.

From a provincial perspective, recent trends analysis concluded that tourism related revenues associated with the tidal fishery grew by 19% between 1990 and 1994, standing at $357 million in the latter year. No estimate of growth is available for the freshwater fishery, however its 1990 provincial tourism revenues were estimated a $199 million.

The tidal recreational fishery in BC is in decline. From 1994 to 1997, angler expenditures (on lodges, charters, and angler supply businesses) declined from $611 million and 8,625 associated direct seasonal jobs to $485 million and 7,050 jobs. One reason for the decline in employment is the uncertainty associated with the regulatory environment. The 1998 non-retention measure for coho affected Central Coast operators severely as angling for coho comprises a major part of the client base in the latter part of the season (August and September) and some lodges closed early.

Provincially, the aquaculture industry is estimated to account for 1,142 Person-Years of direct employment in 1996, 6.4% more than the 1993 level. Total farm-gate revenues generated by the BC salmon farming industry in 1996 were approximately $159 million, indicating that Central Coast operations account for approximately 45% of the value of all salmon farmed in the province. Based on this 45% share, Central Coast operations are estimated to support an estimated 514 Person-Years (PYs) of employment (or an average of 10 per operation). Almost 60% of salmon farming employment is located on northern Vancouver Island. Of the total salmon farming PYs, an average of 40% occurs on the farms themselves, about 30% are provided by processing operations, and the remainder are attributable to the hatchery, transport, sales, and administration. In terms of actual jobs (as opposed to PYs of employment) a recent study has produced estimates that of a total of 1400 BC-wide jobs, 640 are associated with the Central Coast operations of which 30 are permanent Central Coast residents. As for shellfish farms, current provincial-level employment is estimated to be 600 part and full-time jobs; with only five operations, the Central Coast portion of this would be minor.

Direct BC salmon farming (pre-tax) wages and benefits totalled $36.4 million (or an average of $32,000 per person-year, with labourers earning less and supervisory staff earning more) in 1996. Approximately $16.4 million of this amount is estimated to be attributable to operations located in the Plan Area, but most of this income would likely flow to northern Vancouver Island communities where the vast majority of the workers reside.

While resource extraction has been the mainstay of the Central Coast economy, both fishing and forestry have experienced significant downturns and volatility in recent years. Overall, relatively few jobs fall to plan Area residents. Greater local involvement in the workforce is a consistent desire of residents. Both tourism and aquaculture demonstrate the potential for expanded employment

2.0 THE LCRMP PLANNING PROCESS

2.1 Process Overview

The Central Coast Coastal Zone Strategic Plan has been developed as a component of the Central Coast LCRMP, commenced in 1997 as part of British Columbia's Provincial Land Use Strategy. It is consistent with provincial government policy for land-use planning, as described in the *Provincial Land Use Charter (1992)* and in the policy document *Land and Resource Management Planning: A Statement of Principles and Process (1993)*. The land and resource management planning process typically brings together a table of interested parties to negotiate agreements on recommendations to government. The intended outcome of the negotiations is a plan that provides a balance among environmental, economic and social objectives and to create land use certainty.

The role of strategic plans is to evaluate the full range of public land and resource interests and values and make strategic recommendations on their management. The LCRMP extended this role to include the coastal "nearshore" area, to provide direction for provincial coastal land tenuring and advice on associated marine resources and activities under federal jurisdiction. The LCRMP was expected to pilot or lead to further coastal and marine planning through the federal Integrated Coastal Zone Management (ICZM) program, as well as lead to provincial agency coastal planning for tenuring.

The planning approach divided the Plan Area into North and South components, and established two "local" planning tables (North and South Forums) to ensure planning recommendations would be based on local interests and local knowledge. However, due to a need for addressing regional scale issues, a larger Plan Area Forum was created, comprised of North and South Forum members. In addition, a special First Nations Forum was created to accommodate discussions among participating First Nations. The North, South and Plan Area Forums were facilitated by independent contractors, and chaired by the government's Process Coordinator. Technical analysis and mapping for the process was provided by an Interagency Planning Team (IPT), consisting of representatives from provincial and federal agencies, First Nations, and local government.

2.2 Coastal Zone Planning Steps

The following key steps occurred in the development of the coastal and marine component of the LCRMP:

Step 1-Pre-Plan Scoping and Information Assembly

- In early 1995, an inter agency "scoping committee" was established to identify preliminary boundaries, issues, training and information requirements, and potential participants for a Central Coast LRMP.
- Gaps in key information used for LRMPs were identified, and inventory funds provided to agencies to develop the required information.
- Information collection (including coastal and marine information) continued into 1997.
- The scoping committee established a technical team (Central Coast Gap Analysis Team, or CCGAT) to review and recommend revisions to the existing Cabinet-approved Official Study Areas under the provincial Protected Areas Strategy (PAS). A number of OSAs included marine or coastal waters.

Step 2- Announcement, Consultations and Preliminary Organization

- In July of 1996, government officially announced its intent to initiate a land use plan for the Central Coast, and confirmed it would include the coastal zone.
- A Planning Framework Discussion Paper was prepared by an Inter Agency Senior Management Committee and distributed by LUCO in July of 1996 to assist in obtaining feedback from non-governmental organisations (NGOs), the general public, local governments and First Nations on process design and structure.
- First Nations resident in, or with interests in the Central Coast Plan Area were contacted by letter and invited to discuss their involvement in the LCRMP.
- Meetings were held in the summer and fall of 1996 with the general public, stakeholder groups, local government representatives on Vancouver Island and in the Central Coast, and with First Nations.
- Government approved the revised Study Areas in September 1996, and published the CCGAT Report on Revised Study Areas.
- Necessary agreements were developed and signed between the Province and participating First Nations.
- Discussions began with Fisheries and Oceans Canada respecting federal agency participation in the coastal planning component.
- Participating stakeholder, government and First Nation representatives were confirmed.
- A draft work plan and terms of reference for the planning process were drawn up by government.

Step 3-Commencement of Planning Tables

- First Plan Area Forum (PAF) meeting held in June 1997 to review draft terms of reference, workplan and negotiation ground rules.
- A revised Terms of Reference, ground rules and work plan were developed and endorsed in November 1997, confirming the process structure and a December 1999 target completion date.
- PAF established a number of subcommittees and working groups, including a coastal and marine committee.
- PAF letter to DFO and LUCO requesting collaboration on coastal and marine planning resulting in a DFO/LUCO agreement on joint planning for coastal nearshore areas.
- Co-chaired by representatives of the Province, Fisheries and Oceans Canada and participating First Nations, the Coastal and Marine Committee (CMC) provided an independently facilitated forum for examination of issues specific to the coastal nearshore.
- Participants developed draft vision statement, overall plan goals, objectives, and interest statements.
- Presentations were made by IPT and public sector professionals on coastal planning, and coastal information sets.
- A coastal planning workbook was developed to identify all available data inventory; distributed for review/confirmation of information by participants.
- Coastal planning units were delineated and resource descriptions developed for these.
- Resource mapping exercises were conducted to identify coastal areas of planning interest.
- Draft coastal zoning was developed by the IPT and presented for review by stakeholders.
- Presentations were made on government policy and planning concepts, including, coastal planning.
- Special presentations made on request of stakeholders to address marine planning and other issues.
- Public open houses were held in various communities to explain the LCRMP process and available resource information.
- Cross-sectoral groups were used to develop candidate objectives and strategies for resource topics, including those in the coastal zone.
- Sectors were used to develop preliminary zoning maps and associated management regimes, including coastal/marine "hotspots" for priority discussion.

- Participants were organized into sectoral groupings to expedite discussions at forum meetings.
- North and South Forums reviewed candidate protected areas, including those with marine components, to identify level of negotiation difficulty.
- The PAF established task groups as a means of testing the ability to negotiate objectives and strategies for key resource interactions: coastal issues, recreation/tourism forestry issues, and forestry/fish/wildlife issues.
- Task Group negotiations were used by government as basis for evaluating the utility of extending the LCRMP process timeline.

Step 4-Province/First Nations Technical Work

- Government confirmed process extension to March 31, 2001.
- PAF endorsed completion of Task Group work, and commencement of work by IPT to develop a draft planning product over summer of 2000 as a basis for "accelerated negotiations."
- Provincial and First Nations technical staff developed draft coastal and terrestrial planning products for initial review.
- IPT developed an integrated draft coastal zone and terrestrial LCRMP document for accelerated negotiations by stakeholders.

Step 5- Accelerated Negotiations and Recommendations to Government

- Government confirmed it would make a land use decision on March 31, 2001 which will confirm a "phase 2" process to complete the key terrestrial components of the LCRMP draft document.
- Negotiations began on Protection Areas and on an "enabling document" to confirm those elements of a government decision that would be supported by the PAF.
- Coastal and marine stakeholders (CMC) negotiated consensus based on draft IPT work.
- CMC recommended to PAF in March the acceptance of consensus recommendations
- PAF recommendations to government included the consensus recommendations for the coastal objectives and strategies.

Step 6 LCRMP Interim Plan Review

- New government reviewed the April 4 land use decision
- Government announced in October an 18-month to 2-year completion phase for outstanding terrestrial issues.
- Government advised that it would reconvene a smaller terrestrial table to facilitate the complete of the LRMP
- Approval in Principle was announced in November for the Coastal Zone plan component pending final discussions with First Nations and Fisheries and Oceans Canada
- Localised coastal planning commenced in November in those high priority areas identified at the strategic level, beginning with the Broughton Archipelago to Cape Caution area (North Island Straits)

2.3 First Nation and Government Involvement

2.3.1 First Nations

First Nations of the Central Coast Plan Area were invited to participate in the planning process during initial consultations in 1996. Following negotiations, the 13 First Nations represented by the Joint Councils of the Kwakiutl District Council, Musgamagw Tsawataineuk Tribal Council and the Tlowitsis Nation chose to participate; their traditional territories are collectively identified as the South Plan Area. In the north Plan Area the

Heiltsuk, Oweekeno and Nuxalk Nations sat at the planning table. The Kitasoo/Xaixais and the Gitga'at (Hartley Bay Band) First Nations, whose traditional territory includes a small portion of the northern Plan Area, decided not to participate.

All participating First Nations received funding support through contribution agreements with the province to support costs associated with participation and product development. First Nations have been represented at the Plan Area Table, North and South Forum Tables (dependent on the extent of their traditional territories), subcommittees and working groups and the government interagency technical planning team (IPT). In addition, a First Nations Forum was established to provide all First Nations with a common forum for discussing internal matters and to serve as a means for government to government discussions. In 1998 the Gawaneuk Nation of the Musgamagw Tsawataineuk Tribal Council withdrew from the planning process, as a result of uncertainty over the province's response to the Delgamuukw III Supreme Court decision.

2.3.2 Provincial Government

The Provincial Government has played a central role in Coastal Zone Strategic Planning processes, providing process co-ordination and funding support (through LUCO, now MSRM) and technical advice from a range of agencies include MEM, MOF, MELP (now WALP, MSRM), MEI, MAA (now Treaty Negotiations Office, MAG), MAFF and BC Parks. Provincial agency staff provided technical expertise and policy background information throughout the process. Technical work was co-ordinated through the Interagency Planning Team, co-chaired by MoF and MELP staff. Following completion of the interim Plan, government staff were charged with a full review prior to the land use decision announced by the Premier on April 4, 2001.

Since that time government has been working with First Nations and DFO staff to create a separate coastal zone plan from the interim LCRMP endorsed by stakeholders on March 15, 2001

2.3.3 Federal Government

While the federal government has been a member of numerous LRMP processes, the inclusion of the coastal and marine component considerably raised federal involvement considerably. In addition to sitting at the Plan Area and Forum Tables and participating on the IPT, the Federal Government, through Fisheries and Oceans Canada (DFO), co-chaired and provided financial support to the Coastal and Marine Committee. Fisheries and Oceans participation in the planning process was negotiated through the April 30, 1998 Agreement between LUCO and DFO. The CCLCRMP provided a mechanism for DFO to advance integrated coastal zone management planning as directed by the *Canada Oceans Act.*

2.3.4 Local Government

Local Government was represented in the CCLCRMP at the regional and municipal level. In the South Area, the Regional Districts of Comox Strathcona and Mount Waddington were active participants at the Planning Table, as were representatives of the communities of Campbell River, Port McNeill, Port Hardy and Alert Bay. The economic stability of these communities is closely linked with the Central Coast due to direct employment of residents in the Plan Area and through processing of resources extracted from the Plan Area. The Central Coast Regional District represented local government for the Northern Plan Area. Local Government representatives participated in all table discussions, subcommittees, working groups and the IPT.

3.0 Planning & Management Principles

A. Planning and management of coastal zone resources are based on conservation principles, ecosystem management and the precautionary approach.

B. Planning and management of coastal zone resources are based on best available information (including First Nations knowledge) and recognises the current lack of scientific information on marine resources and understanding of ecosystem processes.

C. Planning and management of land and resources are being done in the absence of and recognises the continued evolution of Aboriginal rights and title, and the absence of treaty settlements.

D. Planning and management of land and resources are based (in KDC/MTTC/TN territories) upon the responsibility of caring for the *Aweenakóla / Aweena gwees* given to each Nation by the Creator.

E. Planning and management of land and resources are based (in Heiltsuk territory) on recognition and respect for the Heiltsuk concepts of *Gvilas* and *Laxwa.*

F. Planning and management of land and resources are based (in Nuxalk territory) on Nuxalk reliance upon the coastal and marine environment for community sustainability in all aspects including health, physical and spiritual, social and economic stability

4.0 PLANNING AND MANAGEMENT OBJECTIVES AND STRATEGIES

Note:
See map 4 of First Nations' traditional territories[1] for reference to applicability of "area-specific" management

Note:
Some statements in the following section requiring further discussion with First Nations and federal government. These statements currently reflect the provincial position on these matters and may be amended upon conclusion of these discussions. ***Items under discussion have been identified using bold italic text***

Resource/ Interaction	4.1 Protocols between Province and First Nations
Context for Negotiations (Issues/ Concerns)	• First Nations have been living from the land, sea, air and resources since time immemorial and have never surrendered, ceded or given up title to the land, sea, air and resources within their territories. • First Nations have their own traditional protocol for obtaining approval for use of resources or activities within their territories. • Provincial consultation process is not working for First Nations, and does not respect their traditional system. • First Nations wish to be a part of the designing of new provincial consultation guidelines and policies. • First Nations desire a greater role in the present management and monitoring of resource use and developments. • Government-to-government relationship between First Nations and Province. • Differences of opinion on Aboriginal rights, title and interests within First Nation traditional territories. • First Nation need for respect of traditional protocols on resource uses and activities. • First Nation concerns regarding Provincial consultation process and role in development review and approval. • First Nations role in management of resources and activities within their traditional territories. • First Nations role in inventory and monitoring of resource use and developments. • Willingness to develop agreements to address First Nations issues and role outside of LCRMP process.
Management Intent	*1. To ensure First Nations issues and role in land and coastal resource management and development.*

Objectives	Strategies
A. Address First Nations' issues and concerns respecting land and resource development	*1. The Province will develop protocols with First Nations pursuant to enabling processes signed by First Nations and the Province to address issues identified in Appendix I*

Resource/ interaction	4.2 First Nations Culture & Heritage Sites
Context for Negotiations (Interests/ Issues)	• Importance of entire Plan Area to First Nations from a cultural heritage perspective. • First Nations concern that industry and government do not understand First Nations' cultural connection to land, seas, air and resources when considering uses in First Nations' territories. • First Nations concerns about effectiveness of current development review system to protect or recognise cultural and heritage resources. • History of site degradation, vandalism and/or theft of cultural resources resulting from public knowledge or disclosure of sites. • Desire of First Nations for repatriation of human remains removed from burial sites and held in collections internationally • Lack of First Nations' financial and / or technical resources to deal adequately with protection of cultural sites and resources. • First Nations concerns about adequacy of current provincial policies on Culturally Modified Trees (CMTs). • Provision of information on ceremonial and sacred places to First Nations by federal and provincial public institutions and agencies. • Concerns over public use of First Nations intellectual property
Management Intent	***1. To ensure that First Nations issues and roles are addressed in the management of cultural sites and sacred places***

Objectives	Strategies
A. Address First Nations issues and concerns respecting cultural and heritage resources.	***1. The Province will develop protocols with First Nations pursuant to enabling processes signed by First Nations and the Province to address issues identified in Appendix I***

Resource/ Interaction	4.3 Land and Coastal Tenures 4.3.1 General
Context for Negotiations (Interests/ Issues)	• Community dependence on Crown land for growth opportunities. • Impact of commercial and industrial activities on environment and resources. • Lack of rural zoning by-laws to guide tenuring decisions. • First Nations' role in the tenure and permit review process. • Relationship of tenuring to resolution of First Nations' rights, title and interests. • First Nations' reliance on environment as a food source and livelihood. • Alienation of land in First Nations traditional territories. • Cumulative, negative impacts to First Nations access from tenure issuance. • Perceived lack of local benefit from tenures. • Importance of public land tenures to tenure holders • Need to include stakeholders in referrals and planning
Management Intent	1. To ensure First Nations issues and roles are addressed in tenuring[2], permitting and planning processes 2. To respect and acknowledge First Nations' perspective on Aboriginal title or rights in the land tenure process 3. To ensure new tenured activities maintain long term sustainability of resources, habitat and ecosystems 4. To increase the benefits to First Nations and local residents from land tenure decisions. 5. To ensure existing and future commercial use and activities are authorised 6. To maintain public and First Nations access in the land tenure process

Objectives	Strategies
A. Address First Nations issues and concerns respecting land and coastal tenures	1. The Province will develop protocols with First Nations pursuant to enabling processes signed by First Nations and the Province to address issues identified in Appendix I
B. Avoid infringement of ***confirmed*** Aboriginal title or rights when assessing new opportunities for renewals of tenures and tenured facilities	1. Criteria used to perform sub-tidal and inter-tidal assessments required of tenure applicants for referral purposes will be identified and modified where appropriate to avoid infringement. 2. Affected First Nations will be involved in the development of environmental impact assessments and foreshore or marine studies under provincial jurisdiction that are required to accompany proposals for new or replacement tenures. 3. Tenure related assessments and decisions will be required to incorporate First Nations traditional knowledge, where available and appropriate. 4. Tenures for coastal nearshore areas should provide for continued First Nation access to foreshore and shoreline areas. 5. Coastal nearshore areas important for access and use will not be alienated without-meaningful consultation. 6. First Nations and the Province will collaborate on the development of educational material for distribution with tenure applications. The materials will include information on Aboriginal rights and title, protocol and general cultural information. 7. More detailed land allocation plans may be developed to meet community objectives

[2] The use of the term "tenure" in this section does not include mineral tenures. Mineral tenures are acquired from the Crown through the "free entry" system, in which the explorer is free to enter upon lands where the provincial Crown owns the mineral rights, and claim those rights without prior notification or consultation. Consequently these tenures are approved without opportunity for provincial referral. However, applications for work permits, issued by the Ministry of Energy and Mines, are subject to review and referral to the public, other agencies, local governments and First Nations. Issues related to minerals and energy are dealt with in Section 4.1.4 page 73.

Objectives	Strategies
	Area-specific Strategies - Nuxalk ***1. The Nuxalk will be consulted regarding tenure replacement, renewals, or new applications. Negative impacts from tenured activities on fish habitat or food fisheries will be considered when tenures are being renewed or relocated.*** ***2. The Nuxalk will identify areas under tenure that are of interest to them, for which they have food fishery and fish habitat concerns, in order to flag them when the tenure comes up for renewal or relocation (e.g. for existing areas that have gone through the tenure process) for referral to the Nuxalk and DFO.***
	Area-specific Strategies - Oweekeno 1. Further guidance on specific uses and activities may be provided in a more detailed coastal land use plan in Oweekeno territory 2. Where appropriate, any tenure applied for in Oweekeno territory will take the form of a license of occupation, pending settlement of treaty negotiations. 3. Referral requests to the Oweekeno Nation will be accompanied by all pertinent information on the development proposal, and provision made for extension of the referral response period to accommodate review of detailed proposals.
C. Ensure that the siting of coastal nearshore tenures protects and conserves habitat and associated species, including fish and fish habitat (also refer to Section 4: Objectives for impact on critical and sensitive habitat and associated species).	1. Refer to Section 4.1.6: Strategies for development proposals that may impact fish and fish habitat, critical and sensitive bird habitats and species populations 2. Tenure provisions will be applied to avoid disturbance during critical rearing and spawning periods, particularly for herring spawn areas, kelp beds and eulachon streams (refer to Section 4.1.6: strategies). 3. Tenures that may negatively impact recovery of abalone stocks will not be issued. 4. New and replacement tenures will be avoided in known eulachon spawning grounds and juvenile rearing areas in front of these spawning grounds. 5. Participation by First Nations in application, monitoring and enforcement of the habitat protection provisions of the Federal Fisheries Act will be determined through agreements with the federal government via relevant processes (e.g. Aboriginal Fisheries Strategy, treaty, watershed based fish sustainability planning). 6. New tenuring opportunities will be limited or restricted in areas of existing high tenure concentrations where uses are having a confirmed negative impact on other resource values, activities or uses. 7. Ecosystem capability studies will be used, where possible, as an ecological basis for issuance of new and replacement tenures. Priority areas for study will be determined in consultation with DFO and with First Nations. 8. Tenures should be located or have mitigation measures attached such that impacts to sensitive nearshore habitats are addressed.
	Area-specific Strategies - Heiltsuk 1. New developments (e.g. wharves, piers, sewage outfalls) will be avoided in the vicinity of Heiltsuk shellfish harvesting areas
D. Support land use and socio-economic objectives of First Nations and local residents in land tenuring decisions.	1. Key stakeholder groups potentially affected by a land application will be consulted as part of the application referral process 2. Where necessary to provide key stakeholder comments government will consider an extension to the referral process period past 30 days if notified by stakeholder groups. 3. An evaluation of net socio-economic benefits of major commercial or industrial development proposals will be performed to address First Nations and local resident benefits 4. Land will be provided for settlement uses where it is identified in Official Community Plans or Rural Land Use By-laws and subject to referral to First Nations. 5. Mechanisms and strategies will be developed for reconciling conflicts between local governments and First Nations on zoning and planning over foreshore and water within local government boundaries. 6. Concentration of major development projects will be encouraged in established settlement areas. 7. The Province will strive for consistency with regional district rural land use or zoning bylaws in land tenure decisions. 8. The Province, and First Nations will encourage local governments to develop Official Community Plans where they do not already exist 9. Where resource interactions are high, local scale integrated use plans may be developed to provide direction for resource development.
	Area-specific Strategies - Nuxalk 1. Major development projects must be reviewed by local communities planning authorities, including First Nations, before being established in settlement areas.

Objectives	Strategies
E. Minimise loss of public access to coastal nearshore areas from land tenuring.	1. Tenure decisions will consider public access needs to foreshore and shoreline areas 2. The allocation of land tenures will contain provisions for access to lands beyond the area under application. 3. Tenure documents will contain provisions that provide for access to and use of boat havens and safe anchorages identified on Map 5 4. Offer letters for tenures adjacent to boat havens and safe anchorages identified on Map 5 will contain provisions that limit impacts to acoustic quality, particularly during periods of peak usage (eg. tourism/recreation season: May 15- September 30).

Resource/ Interaction	4.3 Land and Coastal Tenures 4.3.2 Log Handling
Context for Negotiations (Interests/ Issues)	• Industry need to identify and reserve sites for current and future upland harvesting. • Importance of tenures to the forest industry • Potential impact of siting and operations on other activities and uses. • Potential impact on marine habitat and water quality, other marine resources and First Nations access to marine resources. • First Nations role in the siting and timing of activity of log handling. • Need for training and employment opportunities for First Nations and local communities. • Perceived lack of local benefit from tenures. • Clean up of sunken logs and debris • Need to include stakeholders in referrals and planning
Management Intent	1. To ensure that First Nations issues and roles with log handling are addressed in tenuring, permitting and planning processes 2. To ensure environmentally sustainable log handling and storage operations. 3. To encourage appropriate siting of log handling and storage activities and facilities. 4. To increase First Nations benefits from coastal log handling activities.

Objectives	Strategies
A. Address First Nations issues and concerns respecting log handling	1. The Province will develop protocols with First Nations pursuant to enabling processes signed by First Nations and the Province to address issues identified in Appendix I
B. Locate and manage coastal log handling operations to protect and conserve coastal near-shore habitats, fish habitat and marine populations	1. Detailed marine habitat surveys of all log storage and floating camps will be undertaken in collaboration with First Nations, government and industry. 2. Log storage areas will be sited to avoid Aboriginal marine harvesting areas (e.g. finfish, shellfish and spawning grounds, seaweed). 3. Studies will be undertaken to determine the impact of log handling on the marine environment 4. An independent study will be conducted on selected log storage sites to determine impacts on the adjacent marine environment. 5. Negative impacts (siltation/sedimentation) of forestry activities on marine life, particularly clam beds, will be avoided. 6. Where log handling tenures are located on identified salmon and eulachon migration routes, tenure provisions will restrict activities during migrations periods. 7. An environmental assessment and monitoring, mitigation and restoration measures will be required of all new and replacement log storage sites 8. First Nations, government and industry will collaborate to establish innovative techniques and incentives to minimise environmental impact (eg. Roll-on/roll-off barges and log dewatering) working 9. The siting of log handling sites will be required to meet or exceed the criteria pursuant to pertinent legislation 10. Site remediation should be addressed with the issuance of new and replacement tenures ***Area-specific Strategies Oweekeno*** **1.** Water based log storage and handling in Owikeno Lake and Rivers Inlet estuary will be eliminated and log handling operations will be concentrated in a single, central location. Industry and the province will collaborate with First Nations in the implementation of this strategy.
C. Improve the identification and siting of coastal log handling operations.	1. Central Coast Guidelines for-location and management of log storage and handling facilities will be developed by relevant government agencies working with First Nations and with input from industry. Guideline requirements will be assessed by appropriate regulatory agencies involved with the tenuring process. If coast-wide guidelines are-subsequently developed by government agencies, the more stringent environmental conditions will apply. 2. Proponents will be encouraged to consolidate their log handling applications along with forest development plans to facilitate application review. 3. Where appropriate, log dump and storage sites will be located in previously tenured areas, with consideration for biolophysical capability, long term and cumulative impacts and community interests. 4. A task group of provincial and federal government agencies, First Nations and industry will be formed to identify suitable sites for log handling, booming and heli-log drop facilities in First Nations territories. 5. Sites will be reserved for future log handling activities where determined to be suitable and appropriate. Reservation of sites does not preclude

Objectives	Strategies
	the need to meet all applicable requirements at the time of tenure application and use.
	Area-specific Strategies - Nuxalk
	1. Forest development plans will include possible dump and log storage sites to provide First Nations and local communities with opportunity to provide input on final site locations
	2. Forest Act Tenure documents will require operators to have log recovery plans in place to address chance and catastrophic log loss.
	Area-specific Strategies - Oweekeno
	1. Appropriate locations for log handling may be identified as part of a detailed land allocation planning for Oweekeno territory
D. Promote and encourage First Nations economic benefits and training from log handling.	1. Timber companies will be encouraged to develop First Nations employment programs. 2. The forestry technician program will be promoted as a means of increasing the training and role of First Nations in log handling activities.

Resource/ interaction	4.3 Land and Coastal Tenures 4.3.3 Finfish Aquaculture
Context for Negotiations (Interests/ Issues)	• South Plan Area is provincially significant farmed salmon production area. • Potential exists for farming of non-salmonid species. • Potential impact of net cage salmon farming on marine environment (marine water quality, noise, marine mammals and other resources). • Potential impact of net cage salmon farming activities on other coastal users and activities. • Concerns about siting of existing salmon farms and level of consultation on siting with local communities and First Nations. • Concerns about impact of farm fish escapes on native salmon stocks. • Range of opinion and level of support by First Nations on finfish aquaculture. • Need for co-operation between industry and Province. • Need to address employment, capacity and training needs of First Nations who are interested in fish farming. • Need to include and address First Nations concerns in studies done on the fish farm industry. • Need to include stakeholders in referrals and planning • Emerging provincial government policy and regulations for finfish industry • The Oweekeno Nation does not support finfish aquaculture within its traditional territory • The Oweekeno will only support finfish operations employing closed containment systems • The MTTC does not support finfish aquaculture within its traditional territory • The Heiltsuk will not support finfish aquaculture unless Heiltsuk requirements are addressed
Management Intent	1. To ensure that First Nations issues and roles are addressed in tenuring, permitting and planning processes 2. To ensure appropriate planning and siting of fish farms 3. To encourage environmentally sustainable fish farm technology and practices, including operational research 4. ***To minimise the impact of finfish farms on marine environment and resources*** 5. To prevent the escape of farmed salmon 6. To protect the health of wild fish populations. 7. To enhance the economic viability and First Nation's and local residents' benefits from fish farming.

Objectives	Strategies
A. Address First Nations issues and concerns respecting finfish aquaculture	1. The Province will develop protocols with First Nations pursuant to enabling processes signed by First Nations and the Province to address issues identified in Appendix I
B. Ensure siting of fish farms in suitable sites *	1. Selection of farms to be moved, and sites for relocation or pilot studies will be based on consideration of potential effects on the environment, adjacent communities, First Nations, local governments and tourism opportunities, features and activities. 2. First Nations traditional food fisheries and harvesting areas for shellfish will be avoided in site relocations and new siting. 3. Representatives of municipal government and regional districts will be included in the public discussion process related to the siting of fish farms. Public discussion may include a public hearing where specific zoning exists. 4. First Nations will develop policies on non-salmonid fish farming. First Nations will not support non-salmonid finfish farming unless First Nations requirements are addressed 5. Open netcage operations will not be sited on significant salmon migration routes as determined by DFO in consultation with the Province and First Nations. 6. ***The cap on new salmon farm tenures will be reviewed by the Province based on the results of the Salmon Aquaculture policy framework implementation. The Province and DFO will meet with scientists, industry and stakeholders to discuss what measures are required (including research priorities) for government to meet the intent of the SAR recommendations.***

* *denotes that management direction is currently being addressed by policy and regulation*

Management objectives and strategies included in this document are without prejudice to First Nations on land and resource management issues and their claims of Aboriginal rights and title.

Objectives	Strategies
	7. Local scale integrated resource planning processes will be established as a mechanism to develop appropriate zonation including suitable and/or unsuitable areas for aquaculture activities. This work will be completed in a timely fashion. 8. Relocation decisions will be made with consideration of: impacts on stakeholders, adjacent communities, First Nations and local governments; and with consideration to appropriate zoning; and, constraints to farms, including health, safety, staffing issues and logistics.
	Area-Specific Strategies - Heiltsuk 1. Tenuring decisions will be made with consideration of impacts on Heiltsuk
	Area-Specific Strategies - KDC/MTTC/T 1. The Province will consult with individual First Nations regarding proposed sites in KDC/MTTC/T territories in accordance with protocol agreements 2. ***The province will work together with the KDC/MTTC/TN to identify areas that are suitable or unsuitable for fish farm sites either through applications or future planning initiatives.***
	Area-Specific Strategies - Nuxalk **1.** Relocation decisions will reflect the siting criteria that are based on the Environmental Assessment Office (Salmon Aquaculture Review) recommendations where a local scale coastal resource use plan does not exist.
	Area-Specific Strategies - Oweekeno 1. The province will work together with the Oweekeno to identify areas that are suitable or unsuitable for fish farms sites either through applications or future planning initiatives. 2. ***Where conducted local scale coastal planning studies will provide the basis for new sites in the Oweekeno territory.***
C. Support development of new salmon farming technologies and practices	1. Independent monitoring of sites will be done to verify industry monitoring results. 2. Ongoing fine-tuning of practices and technology will be reinforced. 3. Industry will be encouraged to improve feed composition and delivery systems 4. pilot programs for closed containment technology will be reviewed with consideration for program expansion 5. Upon confirmation that closed containment systems are environmentally and economically viable, a transition program will be developed for conversion of existing net-cage farms to closed containment and new tenure opportunities will be identified
	Area-Specific Strategies – Nuxalk 1. Means will be explored for Nuxalk participation in the development of improved and innovative technologies including containment systems and "green" technologies. 2. Research will be undertaken on innovative technology for enhancing environmental protection, focusing on such areas as greater security against escape, improvement of feed composition and delivery systems; and containment. 3. Province and Nuxalk will consider co-operative projects in innovative pilot and demonstration projects.
D. ***Manage*** impacts from finfish aquaculture operations on the marine environment and First Nations food sources	1. Fish farms will be managed on a coast-wide basis to avoid the creation of local or regional significant negative impacts, including water quality. 2. Criteria for assessing the impacts and risk of impacts will be developed. 3. Fish farm tenure applicants will be required to prepare a management plan that describes the proposed development and provides information on resource values and uses in accordance with provincial criteria* 4. Operators will be required to leave abandoned sites, including the seabed, in a safe, clean and sanitary condition subject to DFO guidance.* 5. Companies or the Salmon Farmers Association will be required to post a performance bond for site clean-up on abandonment that is sufficiently large to address cleanup costs. 6. Appropriate assessments will be conducted on the effects of finfish farming on areas used by First Nations for food sources, bottom recovery and other site impacts prior to issuance of new tenures* 7. Farming of indigenous species will be encouraged, where desired by local communities and First Nations 8. Aquaculture approval documents may be suspended for first violation of new standards depending upon severity of circumstances and may be cancelled where repeated violations of new standards occur. 9. The new provincial policy framework for salmon aquaculture will be consistent with the federal Fisheries Act and the no net loss principle of DFO's habitat management policy.
	Area-Specific Strategies - KDC/MTTC/T

** denotes that management direction is currently being addressed by policy and regulation*

Management objectives and strategies included in this document are without prejudice to First Nations on land and resource management issues and their claims of Aboriginal rights and title.

Section 4 Planning and Management Objectives and Strategies

Objectives	Strategies
	1. Management measures will be improved to control predation in order to avoid the shooting or chemical treatment of predatory species
	Area-Specific Strategies - Nuxalk
	1. Special attention will be paid through research and monitoring to the incidence of escaped farm fish.
E. Minimise the risk of escapes from finfish farms.	1. Programs will be established to monitor, track and eliminate escaped farm salmon. 2. The monitoring and reporting of escapes by fish farms will be improved.* 3. Aquaculture tenures may be terminated upon failure to comply with escape prevention requirements 4. Plans will be implemented to reduce the number of escaped Atlantic salmon in the Central Coast 5. Farms will be required to prepare and implement escape recovery plans, with provision for an independent audit and subject to enforcement. Escape recovery plans must be developed to ensure that non target species are not impacted. 6. Potential for escape of farmed salmon will be a prime consideration when making decisions regarding design and relocation of existing farms or siting of new pilot research and development facilities.*
	Area-specific Strategies - Heiltsuk 1. Aquaculture management plans will be required to identify the specific measures (i.e. the technological/engineering controls and husbandry practices) to be adopted at the farms to prevent escape of farmed fish. 2. Escape recovery plans will be implemented on a regional basis. *
	Area-specific Strategies - Oweekeno 1. Specific measures and standards to prevent escape of farmed fish (i.e. the technological/engineering controls and husbandry practices will be developed
F. Improve management and understanding of escaped farm fish.	1. The impacts of escapes will be monitored and assessed. * 2. The province will notify First Nations and the public of escapes as soon as possible after their occurrence 3. Consideration should be given to expanding the Atlantic Salmon Watch Program. The results of the Atlantic Salmon Watch Program should be considered in determining the fate and behaviour of escaped Atlantic Salmon 4. The salmon aquaculture industry will provide improved estimates of fish on hand at each site*. 5. The salmon aquaculture industry should explore ways to pay commercial fishermen a fair price for escaped Atlantic salmon caught during commercial openings.
G. Improve the economic viability and First Nations' management opportunities for fish farming in areas accepted for aquaculture development.	1. Where desired by First Nations, the province will endeavour to provide developmental opportunities for First Nations within their traditional territories 2. Co-operative ventures between industry and First Nations and local communities will be encouraged
	Area-specific Strategies - KDC/MTTC/T 1. Capable and suitable foreshore and upland will be made available for the growth and development of sustainable fish farming, where appropriate 2. Industry will be encouraged to establish new economic and training opportunities for First Nations in closed containment salmon aquaculture. 3. Industry will be encouraged to involve First Nations in pilot projects with new technology.
	Area-specific Strategies - Nuxalk 1. Support will be provided for community economic development analysis and for locally based entrepreneurs to assess fish farming opportunities.
H. Fully research the impacts of salmon aquaculture on wild salmon and other marine species	1. Governments will be encouraged to initiate research into: • Disease transfer to wild salmon stocks • Effects on marine mammals from anti-predation measures • Effects of night lights on wild marine species • Predation of wild juvenile salmon and other marine finfish by net-caged farmed salmon

** denotes that management direction is currently being addressed by policy and regulation*

Management objectives and strategies included in this document are without prejudice to First Nations on land and resource management issues and their claims of Aboriginal rights and title.

Objectives	Strategies
	• Impacts from colonisation and interbreeding by farmed Pacific salmon • Impacts on benthic community • Impacts from pesticides and antibiotics on the marine environment • Impacts from the introduction of an exotic salmon species to the BC coast • Impact on water quality as pertaining to shellfish

Resource/ Interaction	4.3 Land and Coastal Tenures 4.3.4 Shellfish Aquaculture
Context for Negotiations (Interests/ Issues)	• Lack of available, biophysically capable and suitable Crown lands for development of the shellfish aquaculture industry. • Lack of support for the industry from local government, First Nations and coastal communities for development of industry. • Lack of capability and suitability studies to support industry development initiatives. • Potential impact of shellfish aquaculture siting and operations on other coastal users and activities. • Potential for sites and operations to prevent public access to beaches. • Potential for sites and operations to interfere with traditional food gathering by First Nations. • Need to provide opportunities for First Nations training in the industry, and in site assessment. • Range of opinion and level of support by First Nations on shellfish aquaculture. • Perceived lack of meaningful consultation with First Nations. • First Nations concerns that they will be excluded from this industry. • Need to increase First Nation and local community capacity building and employment opportunities.
Management Intent	1. To ensure First Nations issues and roles are addressed in tenuring, permitting and planning processes 2. To ensure appropriate planning and siting of shellfish aquaculture operations. 3. To protect the marine environment and resources from negative impacts of shellfish aquaculture operations 4. To increase the socio-economic benefits of shellfish aquaculture to First Nations and local residents

Objectives	Strategies
A. Address First Nations issues and concerns respecting shellfish aquaculture	1. The Province will develop protocols with First Nations pursuant to enabling processes signed by First Nations and the Province to address issues identified in Appendix I
B. Provide suitable sites for the growth and development of shellfish aquaculture.	1. MAFF will provide First Nations with existing broad scale shellfish biophysical capability assessment data and high capability areas will be further reviewed with reference to site specific feasibility studies. 2. MAFF will encourage the development of training opportunities for First Nations to conduct site-specific capability assessments 3. The environment of known shellfish growing areas that have been closed due to microbial contamination will be remediated, where required and feasible. 4. Criteria will be developed for evaluating shellfish aquaculture applications and site suitability maps 5. Local government plans and bylaws will be encouraged to maintain opportunities for expansion and amendment of shellfish aquaculture tenure boundaries. 6. Siting must not jeopardize safety and navigation (including safe havens and harbours) and should minimize impacts to commercial fishery harvesting ***Area-specific Strategies - Nuxalk*** 1. The Province will encourage and assist with local government plans and bylaws to maintain opportunities for expansion and amendment of shellfish aquaculture tenure boundaries, and retention of previously tenured shellfish culture areas. 2. MAFF and the BC Assets and Lands Corporation (BCAL) will work with local communities, shellfish aquaculture industry and First Nations government representatives to develop criteria for evaluating shellfish aquaculture applications and site suitability maps.
C. Minimise the negative impact of shellfish aquaculture on First Nation food, cultural heritage resources, other marine resources and activities	1. Further studies on the sustainability of the existing shellfish industry will be encouraged. 2. Where required and feasible, studies will be conducted to assess the land use capability of water bodies 3. First Nations will be included in the development of suitability maps for shellfish aquaculture development in order to avoid areas of demonstrated high risk to other resource values or activities and uses 4. Wild shellfish harvesting areas critical or important for First Nations needs will be identified by First Nations for consideration in siting decisions 5. Wild shellfish harvesting areas critical or important for public recreation and tourism needs will be identified for consideration in siting decisions 6. Aboriginal rights respecting shellfish harvesting will be maintained

Objectives	Strategies
	7. Public access to beaches will be considered in siting decisions. 8. Studies will be conducted on the biological effects of existing, non-indigenous shellfish species on indigenous shellfish species.
D. Promote and enhance benefits to First Nations and local residents from shellfish aquaculture	1. Selected areas ***may*** be made available for exclusive First Nations development of shellfish aquaculture, including community-oriented and family-held tenures 2. First Nations and local residents will participate in the identification of employment, economic development and training opportunities through work with industry 3. Training programs will be developed to communicate information and education on technologies, husbandry and biological requirements of culture species 4. Industry will be encouraged to provide opportunities for co-operative ventures with First Nations and local residents. 5. Research into new methods of shellfish culture will be encouraged. ***Area-specific Strategies Heiltsuk*** 1. The Province will work with the Heiltsuk to assess current Heiltsuk interest in shellfish aquaculture as well as to provide advice and assistance in industry development through workshops and meetings in Bella Bella 2. The province will share available information and maps on suitability and biophysical capability information and assessment procedures to support both off bottom and beach shellfish culture 3. The province will develop an agreement with the Heiltsuk for the undertaking of a shellfish pilot project , at the request of the Heiltsuk

Resource/ Interaction	4.3 Land and Coastal Tenures: 4.3.5 Sport Fishing Lodges
Context for Negotiations (Interests/ Issues)	• Existing DFO Sport Fish consultation processes • Minister of Fisheries and Oceans decision making authority with respect to recreational sport fishing • Potential impact of sport fishing lodges on fish populations and overall fish catch. • Some stakeholders and First Nations are concerned about lack of regulation of overall fish catch by lodges and their guests. • Perceived conflicts with local residents and First Nations due to other recreational experiences provided by lodges, such as bear watching. • Potential impact on marine ecosystems from concentrations of lodges in some areas. • Potential impact of sport fishing lodges on marine environmental quality. • Perceived lack of apparent social or economic benefit to local communities or residents from presence and operation of sport fishing lodges. • Potential impact of unauthorised sport fishing charters and operations. • Perceived lack of catch data monitoring of all species utilised in sport fishery
Management Intent	1. To ensure First Nations issues and roles are addressed in tenuring, permitting and planning processes 2. To tenure sport fishing lodges on the basis of marine resource capacity and environmental sustainability. 3. To ensure increased local socio-economic and First Nations benefits from sport fishing lodges. 4. To control non-tenured mobile sport fishing camps and charter operations.

Objectives	Strategies
A. Address First Nations issues and concerns respecting sport fishing lodge tenures	1. The Province will develop protocols with First Nations pursuant to enabling processes signed by First Nations and the Province to address issues identified in Appendix I
B. Minimise impact of commercial sport fishing lodges on fisheries, the marine environment, and other uses or activities.	1. The Federal government should work with First Nations to address First Nations issues with fish harvest associated with sport-fishing lodges. 2. Marine foreshore impacts and impacts on other users should be evaluated as part of any application for sport fishing lodge tenures. 3. Sport fishing lodge tenures should only be issued in areas where increased sport fishing pressure can be sustained 4. The extent to which the siting of existing lodges is consistent with fisheries management objectives will be reviewed. 5. The number and size of commercial fishing lodges and their impacts on fisheries, environment and other uses or activities will be considered in the review of any applications for new land tenuring. 6. Commercial tenures will be referred to key recreation user groups for comment. 7. A working group will be established of Federal, Provincial, First Nations and Sport Fishing Sector representatives to develop protocols to address issues of concern, discuss co-operative arrangements and to minimise future conflicts. Current issues include: • The number of Sport fishing lodge tenures in the Oweekeno territory • The evaluation of replacement sport fishing lodge tenures against land use capability studies, appropriate siting criteria, size limitations and any detailed coastal land use plans or studies in Oweekeno traditional territory ***Area-specific Strategies Heiltsuk*** 1. The determination of zones for commercial sport fishing lodges will be made in more detailed coastal planning in Heiltsuk territory ***Area-specific Strategies Oweekeno*** ***1. The Federal government should work with First Nations to address First Nations issues with fish harvest associated with sport-fishing lodges.*** ***2. Marine foreshore impacts should be evaluated as part of any application for sport fishing lodge tenures.*** ***3. Sport fishing lodge tenures should only be issued in areas where increased sport fishing pressure can be sustained*** ***4. The number and size of commercial fishing lodges and their impacts on fisheries, environment and other uses or activities will be considered in the review of any applications for new land tenuring.***
C. Provide social and economic benefits for First	1. Assessments will be required for new ***major*** commercial fishing lodge tenure applications to identify potential social and economic impacts and benefits to First Nations and local residents. Such assessments should be done with input from local residents and First Nations.

Objectives	Strategies
Nations and local residents from commercial sport fishing lodge operations	2. Sport fishing lodges will be encouraged to employ local residents, purchase goods and supplies locally, and use local operators for associated recreational charters. 3. Sport fishing lodge tenures will be ***encouraged*** to undertake an assessment of social and economic impacts and benefits at the time of tenure replacement
D. Minimise the adverse effects of non-tenured mobile sport fishing and charter operations.	1. Federal agencies should explore opportunities to work with the Province, local government and First Nations to develop a strategy for identification and regulation of mobile sport fishing operations and other unauthorised ***activities.*** The Strategy will include methods to prohibit operations in areas where First Nations harvest marine resources for food, social or ceremonial purposes, or where marine resource populations are depleted

Resource/ Interaction	4.3 Land and Coastal Tenures: 4.3.6 Settlement
Context for Negotiations (Issues/ Concerns)	• Need for structures and infrastructure development associated with settlement and other activities, including those of First Nations. • Concern about unauthorised floating homes and float home communities. • Potential impact of improperly located homes on marine environment, especially in areas of poor tidal flush. • Necessity of floating homes to accommodate temporary needs for housing in isolated areas and to offset shortage in available Crown land in adjacent communities. • Impact of settlement tenures on First Nations interests and treaty negotiations. • Need to include stakeholders in referrals and planning
Management Intent	1. To ensure First Nations issues and roles are addressed in settlement tenuring, permitting and planning processes. 2. To minimise impact on resettlement opportunities for First Nations within their traditional territories. 3. To promote appropriate and sustainable settlement and community infrastructure development. 4. To provide float home opportunities in appropriate locations

Objectives	Strategies
A. Address First Nations issues and concerns respecting settlement and resettlement activities	1. The Province will develop protocols with First Nations pursuant to enabling processes signed by First Nations and the Province to address issues identified in Appendix I
B. Minimise impact of tenuring on resettlement negotiations	1. Tenure decisions will consider resettlement areas identified by First Nations 2. First Nations will work with the Federal and Provincial Governments on the planning, development and provision of necessary re-settlement infrastructure and services
C. Provide suitable land (upland, foreshore and nearshore) to support settlement activities and infrastructure development	1. Land will be provided for community development, public works, utilities and institutional uses, where identified in more detailed planning 2. First Nations and the Province will work together in identifying those areas used by First Nations as cultural (eg isolation areas), recreational and youth camps to be reserved from Provincial tenure 3. Refer to Section 4: Water Quality strategies respecting effluent discharges, and Habitat strategies respecting disturbance of habitat. 4. Local government bylaws will be considered in the provision of lands for settlement use. ***Area-specific Strategies - Oweekeno*** 1. New settlement tenure opportunities may be identified as part of local scale land allocation planning studies prepared in Oweekeno traditional territory
D. Ensure the proper siting and use of floating homes and floating structures	1. A community development review process will be developed to assess the desirability of floating communities prior to making tenure (or trespass) decisions. 2. Float home locations and conditions of tenure will be related to employment in remote locations. Locations must be vacated once the employment opportunity lapses 3. Potentially negative impact on the marine environment and impacts on First Nations uses from approved float homes and communities will be addressed through tenure provisions ***Area-specific Strategies - Nuxalk*** 1. Opportunities will be provided for tenured float home communities where they are deemed important to enhance adjacent communities. 2. CCRD and Marine port authority proposed in Section 4.2.4: Marine Transportation and Navigation, will set standards for placement of houseboats and sewage disposal. ***Area-specific Strategies - Oweekeno*** 1. Tenuring, locations and management strategies regarding existing and proposed float homes may be identified as part of a more detailed settlement planning studies 2. Potentially negative impact on marine environment from float homes will be addressed through tenure provisions, which will reflect and detailed settlement planning studies completed in Oweekeno territory

Resource/ Interaction	4.4 Energy and Mineral Use
Context for Negotiations (Interests/ Issues)	• Potential of coastal areas to contain important energy and mineral deposits of significant social and economic value. • Concerns about public and First Nations consultation process related to continuation of existing provincial and federal moratoriums on offshore oil and gas exploration and development. • Potential environmental damage associated with offshore exploration and development activities, particularly to resources relied on by First Nations. • Lack of First Nation support for lifting of offshore moratorium. • Potential economic benefits of energy and mineral exploration and development for local communities and residents. • Potential environmental impact of aggregate removal from coastal areas. • Potential impacts to fish and wildlife habitat and tourism and recreation values from energy and mineral exploration and development • Provision of opportunities for the energy and mineral exploration and development industry. • Perceived lack of meaningful consultation with First Nations. • First Nations role in management and monitoring of energy and mineral exploration and development. • Perceived lack of employment and economic benefits by First Nations from production of this industry. • Provision of First Nations development opportunities, including joint ventures with industry. • Need for enhanced geological data to assess potential opportunities and to attract investment • Need to include stakeholders in referrals and planning
Management Intent	1. To ensure First Nations issues and roles are addressed in mineral and energy tenuring, permitting and planning processes 2. To maintain or enhance opportunities to explore and develop energy and minerals 3. To increase the benefits to First Nations and local residents from energy and mineral exploration and development 4. To improve geo-science databases 5. To foster and support an sustainable and environmentally responsible energy, mineral and aggregate exploration and development industry in a manner consistent with the integrated management objectives of this plan 6. To promote sustainable alternative energy technologies for local and First Nations demand in remote settlements

Objectives	Strategies
A. Address First Nations issues and concerns respecting energy and mineral development	1. The Province will develop protocols with First Nations pursuant to enabling processes signed by First Nations and the Province to address issues identified in Appendix I
B. Accommodate the development of energy and mineral resources with consideration of First Nations and other resource values	1. Mineral resource values, interests, and objectives will be reflected in landscape unit planning and other local level plans 2. The mineral exploration and development industry will be encouraged to work with First Nations in conducting exploration, access development, and restoration practices 3. Measures will be implemented to minimise the impacts of mining and energy production activities on First Nations harvesting of plants for medicinal, food, or social/ceremonial purposes.
C. Provide opportunities for First Nations and local residents to collectively benefit from mining developments	1. The energy and mining industry will be encouraged to train and employ First Nations and local residents 2. The province will encourage the industry to develop agreements with First Nations to maximise the use of First Nations people, facilities and support services in exploration and development 3. The Province will work with industry to encourage the involvement of First Nations in mining, quarrying and gravel development
D. ***Provide opportunities for First Nations and local residents to engage in consultations***	***1. Federal and provincial governments should consult with First Nation if there is any consideration to amend or lift the current moratorium.*** ***2. Any process conducted to develop recommendations on the future status on offshore energy resources should also include public and community consultation.***

Objectives		Strategies
	on offshore oil and gas exploration and development	***3. Any process designed for public review on the moratorium will consider First Nations recommendations*** ***4. First Nations will work co-operatively with neighbouring First Nations on matters pertaining to the current moratorium*** ***5. Studies will be undertaken to determine the impacts of offshore oil and gas exploration and development***
		Area-specific Strategies - Nuxalk 1. Standards and standard operating procedures ***should*** be developed for planning, accessing, developing, implementing, transporting and monitoring for adaptive managing for all activities associated with offshore mineral or energy development.
E.	Promote the completion, upgrading and maintenance of geo-science databases for energy and mineral exploration, geo-technical, geo hazard, and resource management needs	1. The Province will enhance the knowledge of the Central Coast geology (e.g. through scientific research, geological mapping, geophysical and geo-chemical studies, technical workshops) to support opportunities for geological resource discovery and development, and informed resource management decision making 2. The Province will establish priorities to complete and upgrade the provincial geo-science database to standards available to areas of comparable mineral potential in B.C. 3. Opportunities to undertake inventories and marketing studies of potential aggregate and mineral resources in the coastal nearshore zone will be explored. Such studies will be undertaken where feasible. 4. The Province will develop information sharing protocols with First Nations on energy and mineral resource inventory information, as requested
F.	Reduce the negative environmental impacts of mining and energy developments and explorations including industrial minerals and aggregate	1. Measures will be implemented to prevent pollutants from mining developments or energy explorations from running into streams and rivers 2. The Province will ensure that performance bonds are commensurate with reclamation costs. 3. Abandoned mine sites will be remediated where environmental or human health hazards are identified. 4. Operations will be permitted in a manner consistent with maintaining long-term biological values in sensitive fish watersheds, ungulate winter range and critical habitat for higher level plan species 5. Mineral and aggregate resource extraction plans will be required to mitigate environmental impacts
G.	Ensure the potential for coastal mineral resources is realised through environmentally responsible evaluation, extraction, processing and mitigation of impacts	1. Based on identified needs, opportunities will be provided for shore-based infrastructure to support approved upland or marine-based mining and energy operations. 2. Alternative energy sources in the coastal and marine environment such as solar, wind, tidal, geothermal and wave energy will be promoted
H.	Maintain or enhance the opportunity to explore, acquire tenure, develop, produce, process and transport of energy or geological resources, including aggregate	1. Surface land and resource use patterns will be managed so as to integrate with long-term mineral access needs 2. Subsurface resource information will be incorporated into landscape unit level and operational level planning 3. Non-park lands closed to mineral and placer staking will be periodically reviewed to assess the need for continuance or opportunity to amend no-staking reserves

Resource/ Interaction	4.5 Recreation and Tourism
Context for Negotiations (Issues/ Concerns)	• International significance of some tourism and recreation opportunities in the Plan Area (e.g. Inside Passage, Broughton Archipelago, marine fjord and Coast Mountain topography) • Increasing importance of Central Coast as recreation and tourism destination area. • Protection of special recreation features and their settings (e.g., waterfalls, historic timber railroads, large trees). • Updating of special and recreation features inventories. • First Nations role in inventories of recreational values and special and recreation features. • First Nations role in planning, development of siting criteria, development and implementation of guidelines, and in review of all commercial recreation applications. • Exceeding of ecosystem capacity limits to land based recreation and tourism activities in some areas. • More proactive involvement of First Nations, tourism industry and recreationists in land and resource development planning. • Greater involvement of recreationists and tourism operators in land use decisions affecting their interests. • Need for comprehensive tourism/recreation management plans. • Potential damage and degradation of tourism/recreation resources and experience by recreationists/tourists. • Perceived lack of adequate First Nations and local community benefits from recreation and tourism in their areas. • First Nations concern with the protection of archaeological, spiritual and cultural values within their territory. • Respect for First Nations issues and protocol. • Use of First Nations culture and heritage features for industry promotion, with no revenue to the First Nation whose territory the industry is promoting. • Potential impact and damage to First Nations resource harvesting areas and traditional use sites, especially beaches. • Potential conflicts between recreationists and First Nation activities and sites, such as cultural camps. • Need for economic partnerships with First Nations in acceptable recreation and tourism activities. • Lack of meaningful economic participation by First Nations in industry. • Management of angling experience on classified waters
Management Intent	1. To ensure First Nations issues and roles are addressed in tourism and recreation tenuring, permitting and planning processes 2. To ensure recreation and tourism is conducted in an environmentally sustainable manner. 3. To improve inventories related to recreation and tourism features and activities 4. To provide opportunities for First Nations to work with the province, local communities, forest licensees, tourism and recreation sectors in planning and management processes 5. To increase the First Nation and local resident socio-economic benefits from recreation and tourism activities and development. 6. To improve understanding and working relationships between First Nations and the recreation/tourism sector in an atmosphere of co-operation and mutual respect. 7. To improve special and recreation feature inventories and management. 8. To manage the integrity of classified waters and defined angling experience

Objectives	Strategies
A. Address First Nations issues and concerns respecting recreation and tourism activities	1. The Province will develop protocols with First Nations pursuant to enabling processes signed by First Nations and the Province to address issues identified in Appendix I
B. Minimise the negative effects of commercial recreation on the environment	1. Important dive sites will be protected from potential negative impacts of commercial recreation tenures. 2. Tourism associations will encourage their members to follow the First Nations protocol identified in this plan 3. Sensitive and significant recreational features will be protected from commercial recreational intrusion or over-use. 4. Commercial tenures will be referred to key recreation user groups for comment. 5. A system will be developed to address trespassing, garbage and littering, pollution and other negative impacts associated with public recreation including visitor control and damage deposits

Section 4 Planning and Management Objectives and Strategies

Objectives		Strategies
		6. First Nation cultural and/or sacred places will be protected from commercial recreation intrusion or over-use.
		Area-specific strategies Heiltsuk
		1. No new commercial recreation or tourism development will be permitted in the vicinity of Heiltsuk shellfish harvesting areas. Such areas will identified by the Heiltsuk
		2. Recreational or tourism development activities that impact abalone beds will be mitigated.
C.	Improve special and recreation feature inventories	1. An inventory of recreational sites and features will be maintained, and data distribution programs will be established 2. Special feature inventories will be developed in co-operation with First Nations, commercial tourism operators and the recreation sector.
D.	Provide areas and opportunities for commercial recreation and tourism activities, where appropriate.	1. Comprehensive recreation and tourism management plans will be designed and developed as appropriate, including an inventory, or recreational sites and features 2. Criteria will be developed for identifying and classifying potential resort sites that will recognise limitations on siting (flat land, cultural values and potable water). 3. Future commercial recreation and tourism opportunities will be identified and evaluated on the basis of appropriate biophysical capability assessments. 4. Opportunities for upland, shore and marine based facilities will be provided to support First Nations tourism where appropriate. 5. Linkages between foreshore based tourism facilities and upland tourism opportunities will be identified and incorporated into tourism development plans 6. The province will explore the development of a First Nations tourism certification program with the involvement of First Nations. 7. Tenuring processes will consider compatibility of activities and level of use of new tenures on existing angling guide operations and other existing commercial tourism uses
E.	Improve management of wildlife viewing	1. Existing criteria for commercial wildlife viewing will be reviewed, in consultation with First Nations and affected stakeholders. 2. Revised criteria will be incorporated into commercial recreation tenures, in consultation with First Nations and affected stakeholders.
F.	Increase First Nation and local resident benefits from recreation and tourism activities and development.	1. Tourist facility development will be encouraged to locate near existing communities and settled areas where consistent with the tourism experience being offered. 2. Tourist facility development will be encouraged to train and employ local and First Nations residents, purchase goods and supplies locally, and use local and First Nations operators and guides for recreational charters. 3. Commercial recreation tenures that meet local and First Nation commercial recreation development opportunities will be encouraged. 4. The involvement of First Nations in commercial operations on cultural sites and features will be encouraged. 5. ***First Nations may apply for*** key scenic and wilderness areas of interest to First Nations for the development of First Nations cultural and eco-tourism ventures. 6. Tourism operators will be encouraged to engage in direct discussions with First Nations in order to build mutual trust and support. 7. Recreation and tourism tenure applicants will be encouraged to explore First Nations joint venture opportunities.
G.	Promote and maintain strong communications linkages and understanding between First Nations and the recreation/tourism sector.	1. First Nations will work with the tourism and recreation sector to facilitate a cross-cultural education process to increase understanding of First Nations' values and protocol. 2. A First Nations' education/ information program will be developed for distribution to tourism and recreational user groups. 3. Tourism operators are encouraged to ***seek First Nations' sanction/support*** to visit cultural heritage sites as part of their tourism activities. 4. Educational programs (including cultural awareness programs) will be designed and included in management plans for tourism and recreation ventures 5. Tourism operators are encouraged to notify the First Nations in whose territories they are operating
H.	Maintain the integrity of special recreation and tourism use features	1. Governments, with the involvement of the Recreation /Tourism sector, will develop appropriate management approaches and tools for areas containing special recreation and tourism use features at the local planning level.

Resource/ Interaction	4.6 Environmental Quality
Context for Negotiations (Interests/ Issues)	• Marine water quality is critical to continued health and productivity of marine species. • Decline of marine water quality in some areas. • Need for marine water quality monitoring programs. • Habitat contamination in areas of past intensive industrial activity and need for restoration. • Need for increased efforts and support for enforcement of regulations is required. • Constant threat to marine environmental health from transport and storage of oil, chemicals and refined petroleum products. • Need for improvements to oil spill preparedness and response. • First Nations seek a significant role in decisions on herbicide, pesticide and fungicide applications in their traditional territories. • First Nation concerns about effect of pesticide use on food chain, and effects on water quality, food harvesting and community health. • Protection from development of areas with high biodiversity and ecological values. • Concerns over government's management of introduced species and their risks to existing ecosystems and food sources. • Effects of pulp mill pollution, vehicle emissions, industrial chemical waste on important First Nation food, social, and ceremonial resources. • Potential effects of waste disposal and noise from logging camps, mines, tourism, and other provincially tenured facilities on environment, First Nations interests and activities. • Need to include stakeholders in referrals and planning
Management Intent	1. To ensure First Nations issues and role are addressed regarding environmental quality 2. To protect and maintain water quality for continued biological production, and maintenance of species and ecosystem health, and prevent the introduction of additional pollution sources 3. To minimise the risk and potential damage to the marine environment from spills of oil, chemicals and petroleum products. 4. To restore biological diversity attributes by managing forest and other land and resource developments to re-create or recover the required ecosystem elements 5. To address threats to biodiversity management and conservation from environmental contamination and pollution, the application of pesticides and herbicides, and the accidental introduction of exotic species 6. To address contamination and pollution from resource developments and activities 7. To address noise pollution issues

Objectives	Strategies
A. Address First Nations issues and concerns respecting environmental quality	1. The Province will develop protocols with First Nations pursuant to enabling processes signed by First Nations and the Province to address issues identified in Appendix I
B. Maintain a high standard of marine water quality	1. Potential impacts on marine water quality, and effective measures to address those impacts will be used in assessing and adjudicating industrial, commercial and municipal development proposals involving planned point-source effluent discharge into marine waters. 2. Sewage, waste water, bilge dumping and ballast water discharges from marine vessels, sport fishing lodges and other floating structures will be controlled and managed to prevent marine water quality degradation. 3. "Best management practices" will be developed by the Federal Government and applied to vessel discharges into marine waters, with particular emphasis on areas where boats congregate (marinas, harbours, etc.). 4. Regulators should continue to work toward developing tools to manage vessel discharges into marine water including mobile and static pumpout, treatment and disposal facilities for marine vessels. 5. Studies will be conducted by the Federal Government to estimate the ecosystem capability of marine waters for marine pollution from both commercial and pleasure boats, sport fishing lodges and floating structures 6. The Federal Government should conduct marine water quality monitoring programs jointly with First Nations and to develop baseline data to be used in assessing the effect of management strategies 7. The Federal Government and First Nations should develop, apply and enforce standards for marine water quality. Particular emphasis will be

Objectives	Strategies
	placed in high use areas (marinas, harbours, log dumps, etc.). 8. First Nations will work with the Federal Government in the identification and designation of areas where ocean dumping can occur. 9. The Province and First Nations will work with the Federal Government in the identification and designation of "no discharge areas" for marine effluent from vessels. 10. The Province and First Nations will work with the Federal Government to improve marine water quality monitoring programs and databases, particularly for areas intensively used for First Nations food harvesting. 11. Regulatory agencies will provide information on waste discharges to First Nations including current impacts and future forecasts 12. The Federal Government will work with First Nations, local and provincial governments to strengthen and enforce marine pollution regulations, with particular focus on cruise ships, yachts, commercial fish boats, ferries and forestry operations. 13. Sports/recreational/ commercial fishery sectors should increase their responsibility for waste disposal, eg. Green Boat Program.
	Area-specific Strategies - KDC/MTTC/T 1. Hot water discharges from industrial activities will be regulated to avoid impacts to the surrounding environment. 2. High water quality standards will be maintained for provincially tenured marine refuelling facilities
C. Restore marine water quality to high standards in areas where it has been degraded by human activity	1. Impacts of contaminants from known contaminated sites on marine water quality (including effect on habitat and food chain) will be researched, identified , monitored and mitigated or rehabilitated. 2. The Province will work with First Nations, local and federal governments to develop water quality improvement plans to restore marine water quality in degraded areas. 3. The Province will work with First Nations, local and federal governments to address waste management issues for marine and terrestrial sources in areas identified by First Nations and local communities. 4. First Nations will work with the federal government (and, where applicable the provincial government) on agreements designed to prevent marine water degradation, the introduction of non-indigenous plant and animal species and the contamination of areas used by First Nations for food gathering from sewage, waste water, bilge dumping and ballast water discharges from marine vessels. 5. Marine water quality monitoring programs and databases will be developed and implemented with First Nations by agreement in areas intensively used for food harvesting 6. The development of infrastructure will be supported to allow communities and recreational/commercial boat traffic to dispose of their sewage in an environmentally responsible manner. 7. The federal government will seek to consult with First Nations prior to permitting dredging in their claimed territories.
	Area-specific Strategies - KDC/MTTC/T 1. Existing standards and the regulation of pulp mill effluent and sewage discharge will be reviewed to avoid contamination of the surrounding environment and First Nations food sources.
D. Rehabilitate and remediate habitat contaminated or degraded by industrial development.	1. Suspected sites will be investigated to determine if they are contaminated. 2. Site cleanup/rehabilitation plans will be developed for contaminated sites, with priority based on degree of contamination, available resources, and risk to the environment. 3. The federal government should regularly test all marine flora and fauna and birds used by First Nations for food for contaminants and toxins (including lead, dioxins, and PCBs). 4. If contaminants are found in marine foods used by First Nations, the health impacts of these contaminants will be determined and the origin of these contaminants will be studied. Control and mitigation plans will be formulated, implemented and monitored by governments and First Nations.
E. Increase local preparedness and response for spills of oil, chemicals and refined petroleum products.	1. Coastal sensitivity mapping will be completed to identify critical and sensitive habitat and resources, their vulnerability, and appropriate protection and cleanup methods. 2. The Province and federal government will review and develop oil spill response plans in collaboration with First Nations, local communities and stakeholders, and industry utilising traditional ecological knowledge, equipment, personnel and community resources. 3. Spill response training and equipment should be provided to local communities, residents and First Nations. 4. The First Nations and the federal and provincial governments will notify each other in the event of a spill. The federal government will be required to inform the First Nations, within a reasonable timeframe, on the risk, impact and remediation efforts. 5. The federal and provincial governments will provide training to First Nations in spill response, and develop a spill contingency plans to co-

Objectives	Strategies
	ordinate response activities and equipment access between First Nations, and industry operating within the territory
F. Reduce and eliminate pollution and contamination caused by industrial resource developments	1. The province will implement more stringent requirements compelling forest and mining/exploration companies to clean up and remediate sites used for camps or resource extraction 2. The province will reduce the allowable limits of pulp mill emissions and effluent 3. Any new development will be required to show how they plan to reduce harmful emission from their operations 4. The oiling of logging roads will be prohibited. Opportunities for salting of specific sites or in specific situations will be identified as per the protocol agreement.
	Area-specific Strategies – KDC/MTTC/T 1. In collaboration with First Nations, the province will implement measures to protect and monitor glaciers from pollution and contamination due to commercial activities.
G. Reduce and eliminate pollution caused by tourism and recreation operators and clients	1. Monitoring and enforcement of requirements for waste management by tourism and recreation operators and clients will be improved 2. Penalties will be applied to tourism and recreation operators for the conduct of their clients in polluting or littering the environment.
H. Reduce and eliminate leaching from garbage dumps	1. Monitoring and enforcement of requirements protecting against the leaching of effluent from garbage dumps will be improved
I. Reduce noise pollution	1. In collaboration with industry and First Nations, the province will ensure that tenuring and other resource management decisions will act to reduce noise pollution caused by commercial resource developments and transportation methods

Resource/ Interaction	4.7 Marine Protection Areas
Context for Negotiations (Issues/ Concerns)	• First Nations interest in protecting certain areas within their territories from industrial/commercial activities. • Lack of First Nation support for conventional park and ecological reserve designation and management system. • Ability of protection areas to contribute to conservation of biological diversity and the development of sustainable fisheries. • Need for candidate protection areas to recognise and accommodate the concerns of First Nations, local communities and key user groups and address management arrangements. • Implementation of draft Marine Protected Areas Strategy • Need to include stakeholders in referrals and planning
Management Intent	1. To ensure First Nations issues and roles are addressed in the identification, designation and management of protection areas 2. To preserve and study representative and key ecological areas 3. To address the concerns of local residents, resource users and affected tenure holders when identifying areas for protection

Objectives	Strategies
A. Address First Nations issues and concerns respecting coastal and marine and terrestrial protection areas	1. The Province will develop protocols with First Nations pursuant to enabling processes signed by First Nations and the Province to address issues identified in Appendix I
B. Recommended candidate areas will be set aside and management regimes developed that will complement the conservation vision of First Nations, the Province and the Federal Government.	1. Protocols should be developed between the Federal Government and First Nations regarding coastal and marine protection areas. 2. The designation of candidate protected areas to be set aside will be done in collaboration with the First Nations. Both federal and provincial governments will ensure and respect the continued use of MPAs by First Nations for food, social and ceremonial purposes and other traditional practices subject to health, safety and conservation requirements. 3. Specific protection levels will be recommended for proposed areas set aside, with areas protected from industrial activity, which may include but not be limited to ocean dumping, mining dredging, exploration and development of non-renewable resources, direct introduction of exotic species, finfish aquaculture, bottom trawling and dragging. 4. Continued First Nation economic opportunities (including eco-tourism) will be a prime consideration in identifying, designing, and managing areas that are set aside. 5. Candidate areas will attempt to satisfy/address the objectives of the provincial Protected Areas Strategy and the draft federal/provincial Marine Protected Area Strategy. 6. Local and traditional knowledge will be used in the planning and management of designated protection areas, where available 7. Interim management guidelines will be applied to areas agreed to be set aside pending final decision by government-to-government discussions on their status 8. Educational programs (including cultural awareness programs) will be designed and included in management plans for areas set aside. ***Area-specific Strategies - Heiltsuk*** 1. The current "recreation area" status of the Hakai will be reviewed. 2. The Province and Heiltsuk will establish a joint steering committee to explore options for establishment and co-operative management of a conservation and protection system in Heiltsuk territory. Candidate areas for inclusion in the conservation and protection system are identified on Map 6 3. The steering committee tasks may include: • A land use and impact study by the Province and Heiltsuk for the Hakai area • The development of the management arrangements and structures for the conservation and protection system.
C. Engage local communities,	1. Processes will be established to ensure that local communities, their local governments and other affected stakeholders will be involved in the

Objectives		Strategies	
	commercial and recreational fishers, and other affected stakeholders in meaningful participation processes regarding proposed protection areas		development, review and endorsement of proposed protection areas and plans for their management. 2. Local communities will be involved in management of protection areas/ecological areas. 3. Community and stakeholder social and economic impact assessments will be provided for review of recommended protection areas. 4. Clear consultation mechanisms will be established within the existing or revised fisheries advisory processes for any proposed protection areas. 5. Economic transition or fishery allocation strategies may be developed in any management regime for potential protection areas where designation is predicted to cause significant economic hardship to commercial fishers and sport fishing operations.
D.	Promote education, research and monitoring activities within designated marine protection areas	1.	Where appropriate, protection area research will include the relationship of fisheries management to marine protection regimes
E.	Establish a network of a variety of marine protection areas including a core of no-take zones	1.	Contributions to the MPA network in the Central Coast will be developed in collaboration between Federal and Provincial Governments First Nations and stakeholders
		2.	Any fisheries closures in an MPA must be based on sound science and clear conservation purposes and must not infringe upon Aboriginal rights
		3.	MPAs should include those used as a means to enhance recruitment, recover depleted species, provide life stage protection, conserve genetic pools, conserve productive ecosystems and biodiversity, represent habitat types and protect rare, threatened or endangered species and protect ecological features important to fisheries such as spawning/rearing habitats and habitat structures
		4.	A marine ecological classification system will be used to ensure MPAs are placed within and among a variety of oceanographic conditions.
		5.	Research will be undertaken to identify and locate rare, threatened or endangered species and their habitat, ecological features such as spawning/rearing habitats and habitat structures as a basis for the establishment of MPAs.
F.	Provide direction for existing tenures affected by new marine protection areas	1.	Existing tenured uses will continue in areas identified for protection pending expiration or time of replacement of tenure document. Continuation is subject to adherence to tenure provisions.
		2.	Existing tenure applications that are affected by an identified protection area will be assessed and adjudicated on the basis of values and intent of the protection area, as confirmed with First Nations.
		3.	Before formal designation of a protection area, a decision will be made on uses and activities that will be allowed to continue within each protection area.
		4.	Protection area boundaries may be refined to exclude existing tenures which are inconsistent with the protection area.

Resource/ Interaction	4.8 Coastal and Marine Biodiversity Conservation
Context for Negotiation(Interests/ Issues)	• Concern that knowledge and information base on habitat types (including habitat for critical, sensitive, and rare and endangered species) is not well developed. • Concern about level of knowledge of impacts of human activities on habitats and life processes. • Perceived constant potential threat to biodiversity and ecological integrity of naturally occurring species from introduction of harmful or unwanted exotic species. • Lack of collaborative approach to marine conservation and protection efforts among local governments, First Nations, and federal and provincial agencies. • Need to include stakeholders in referrals and planning
Management Intent	1. To address First Nations issues and role in environmental protection and biodiversity research and conservation at all planning scales (regional and landscape) in biodiversity management and conservation planning 2. To improve existing coastal and nearshore habitat inventories 3. To prevent the loss and degradation of coastal nearshore habitat, and rehabilitate ecologically, socially and economically important habitats. 4. To conserve marine ecosystem biological diversity and species populations. 5. To expand marine species and habitat research

Objectives	Strategies
A. Address First Nations issues and concerns respecting coastal and marine biodiversity conservation	1. The Province will develop protocols with First Nations pursuant to enabling processes signed by First Nations and the Province to address issues identified in Appendix I
B. Protect and conserve coastal nearshore fish and critical bird habitats and associated species (including, but not limited to red and blue listed species) from impacts of development and human activities.	1. Development proposals that may impact critical bird habitats will be required to include an identification of sensitive habitats, an assessment of impacts, and suggested measures for habitat protection or maintenance (where information is missing or outdated). 2. Development proposals that may negatively impact fish habitat will be reviewed in accordance with the federal *Fisheries Act* and DFO's *Policy for the Management of Fish Habitat* 3. Point-source discharges will be planned and designed so that deleterious substances are not introduced to fish bearing waters and critical bird habitats. 4. Management plans should be developed for critical estuaries by governments with the involvement of First Nations and including public and stakeholder input. Such plans will provide recommendations for future status and management tools. 5. An interagency process will be developed to proactively protect sensitive coastal nearshore fish habitat (using planning tools such as inventory and mapping; Adaptive Management Practices; planning at various scales; identification of Marine Sensitive Zones (MSZ); and, monitoring and enforcement. 6. The following estuaries have been identified as candidates for the creation of management plans: • Clyak • Cornwall • Kimsquit • Quatlena • Skowlquitz • Stafford • Klinaklini • Knight • Kingcome • Wakeman • Seymour • Nekite • Bella Coola • Bentinck Arm Estuaries • Kwatna • Kilbella • Sheemahant • Genesse Wetland • Neechantz/Machmell Wetland ***Area-specific Strategies - Nuxalk*** 1. Monitoring programs should be developed and implemented in order to assess measurable outcomes of any integrated resource development plan for critical near-shore habitat.
C. Expand inventories of coastal and nearshore habitats for use in management decisions and	1. Coastal nearshore habitats (including red and blue listed species habitat) will be classified and mapped, within available resources, at a variety of scales (using Resource Inventory Committee standards) with the involvement of First Nations. 2. Standards will be developed for the assessment and inventory of coastal nearshore habitat 3. Coastal nearshore areas with priority for habitat restoration and/or enhancement will be identified, mapped and planned at more detailed

Objectives	Strategies
subsequent planning processes	levels. 4. Partnerships will be formed between governments, First Nations and resource users to develop and implement critical coastal nearshore habitat monitoring programs as outcomes of lower level plans.
D. Maintain the diversity and populations of natural species.	1. The timing and scope of resource development activities will be managed to avoid species disturbance during critical life cycle events, particularly herring and eulachon rearing and spawning events. (Refer to section on General Tenures) 2. Research will be undertaken to identify species distribution (e.g. eulachon spawning, eagles and gulls) and temporal patterns to address changes in diversity and populations of natural species
E. Improve knowledge and understanding of marine species	1. Mapping for species activity windows, as in Fisheries Restricted Operating Windows (Sensitive Life Stages) (e.g. MoF and DFO 1998 Area 11 & 12 maps) will be developed and updated with the involvement of First Nations. 2. Inventories will be conducted for locations of representative and high value areas of ecosystem biological diversity. 3. Research will be conducted on mammal populations and the impacts of human activities on their habitats and life processes. 4. Research will be conducted on eulachon lifecycle activities to assist in development of an activity window for this species.

Resource/ Interaction	4.9 Coastal Fisheries and Marine Plant Management
Context for Negotiations (Interests/ Issues)	• CCLCRMP process not designed or endorsed to address fisheries management issues. • Fisheries management perceived to require improvement. • Economic and social hardship due to declines in commercial fish species and other food fish species. • Perceived need for fisheries management to take better account of public and community needs. • Need for fisheries management to improve use of First Nations traditional ecological knowledge and reflect local considerations and knowledge. • First Nations seek a significant role in fisheries management with the federal government. • High dependence of First Nations on food fishery and commercial fishery. • Some First Nations concerned about commercial harvesting of aquatic plants and algae due to reliance for traditional food and commercial rights (e.g. roe on kelp). • First Nation concerns about future commercialisation of currently non-commercial species as alternatives to harvesting salmon and other existing commercial stocks. • Perceived need for improvement in fisheries information and assessment databases. • Need for increased funding of fisheries enforcement programs to increase fish stock recovery and reduce poaching. • Need for improved marketing expertise and promotion of fisheries activities. • Need to increase benefits of commercial fishing activities to local and First Nation residents • Need to include stakeholders in referrals and planning
Management Intent	1. To ensure First Nations issues and roles are addressed in tenuring, permitting and planning processes related to coastal fish and marine plant management 2. To enhance the knowledge and information base for fisheries and fish management programs with increased First Nation involvement. 3. To maintain the integrity of fisheries enforcement programs 4. To ensure sustainable management of marine plant, algae and other species used by First Nations for food, cultural, social, commercial and recreational purposes., 5. To enhance local and First Nation expertise in the marketing, processing and promotion of fishery products. 6. To encourage development of First Nations communal fishery systems

Objectives	Strategies
A. Address First Nations issues and concerns respecting coastal fishery and marine plant management.	1. The Province will develop protocols with First Nations pursuant to enabling processes signed by First Nations and the Province to address issues identified in Appendix I
B. Initiate programs and strategies aimed at increasing the involvement of First Nations the Province, stakeholders and the general public in fisheries management.	1. First Nations will approach and engage DFO directly to address fisheries management issues outside of the structure of the CCLCRMP. 2. DFO should work with First Nations and the Province to explore the potential for new structures to share in fisheries resource management decision making. 3. DFO should implement Integrated Coastal Zone Management planning that will address fisheries management issues, as identified by individual First Nations. 4. DFO should continue to develop and enhance partnerships with the Province and First Nations to participate in fish habitat management. 5. Where possible, funding allocations to support partnerships among the First Nations, the Province and DFO will be made on an annual, rather than periodic, basis ***Area-specific strategies - Nuxalk*** The federal government should support integrated coastal planning in which the following fisheries management issues may be addressed, where appropriate: • Development of a salmon resource allocation framework that enacts the *Sparrow* decision's Doctrine of Priority. • Conservation of fish stocks, restoration and enhancement of fish habitat and increases to fish populations including salmon and eulachon.

Objectives	Strategies
	• Mechanisms for the consultation of Nuxalk in program establishment, policy development and management decisions with respect to fish populations and fish habitat. • Improvement and enhancement of fisheries enforcement programs. • Incompatible commercialisation of [marine] species where the species is used for Nuxalk traditional foods. 1. Government regulations and policies will be reviewed with the public and Nuxalk to ensure they meet the priority of use and that recreational fishing is being done in a manner meeting fish population requirements and allocation objectives.
C. Improve planning inventory, research and data management for commercial and recreational fisheries.	1. Governments will collaborate in developing and funding programs for further research and inventories of oceanographic data, marine ecosystems, and anthropogenic impacts on the marine environment. 2. Co-operative marine data sharing protocols will be developed among levels of government, First Nations and communities and stakeholders (including commercial and recreational fishers). 3. Systems for sharing, retrieval and dissemination of, fishery data will be improved by governments, in collaboration with First Nations and stakeholder groups. 4. Standards will be developed and adopted for fishery inventory and analysis. 5. Areas of overlap in the collection and management of fishery data will be identified and addressed. 6. Governments will collaborate in the development of more detailed planning projects. 7. Recreational fishery inventories will be increased. 8. The Province and First Nations will develop protocols respecting First Nations' involvement in the collection and analyses of information for for fisheries under provincial management.
	Area-specific strategies - Nuxalk 1. The Province and federal government will work with the Nuxalk to identify opportunities for increased Nuxalk involvement in fish inventories, fish habitat identification and management, fish population management and fish harvesting in their territory 2. Fisheries management research efforts will be reviewed in consultation with Nuxalk to determine opportunities to address species of particular significance to the Nuxalk, starting with eulachon
D. Improve the scope and level of enforcement of existing coastal resource management legislation and regulations.	1. Federal and provincial staffing and funding levels for enforcement of coastal and marine zone regulations that fall within, or are affected by, the CCLCRMP will be reviewed for adequacy and options for improved enforcement, including community policing, can be explored. 2. The Federal government should involve First Nations in more effective and co-operative fisheries regulation enforcement within their territories.
	Area-specific strategies - Oweckeno 1. The Oweekeno will develop a Fisheries Enforcement Protocol with DFO
E. Manage and maintain marine species, including those used by First Nations for food, social and ceremonial purposes, and where necessary, restore to sustainable levels.	1. Marine flora and fauna utilised for food, social, and ceremonial purposes will be identified by First Nations and managed to ensure healthy and harvestable population levels for First Nations. 2. Harvesting of aquatic plants and algae will be based on sustainable harvesting rates and methods to achieve fish habitat conservation and biodiversity maintenance. 3. Partnerships will be promoted among industry and government for research and development of value-added products and for marketing of marine plants and algae. 4. Provincially administered marine fisheries abundance levels will be reviewed with First Nations before allocation decisions are made. 5. Resource allocation and decision making (eg. Government referral system on development proposals) will include consultation with First Nations regarding maintenance of access and harvesting opportunities by First Nations to marine plants and algae, traditional fishing, marine hunting and harvesting grounds, sea birds and sea bird eggs ***6. The Province will account for First Nations' requirements for marine plants before issuing harvest permits for non-First Nations use.***
	Area-specific strategies - Heiltsuk 1. Birds used by Heiltsuk , as traditional food sources should be regularly tested for contaminants and toxins (including lead, dioxins, and PCBs).
	Area-specific strategies - Oweekeno 1. The federal government is encouraged to issue areal licences to individual sport fishermen.

Objectives	Strategies
	2. The federal government is encouraged to issue sport fishing licenses for coho and chinook only in order to protect Oweekeno food fisheries.
F. Increase local resident and First Nations expertise and benefits from fish and shellfish production, processing and marketing.	1. Assistance will be provided to communities and First Nations in developing markets and market strategies, and in enhancing production through existing and new community processing facilities. 2. Fisheries Renewal BC partnerships will be established by the Province with First Nations and communities to implement market strategies. 3. The BC Salmon Marketing Council and other like organizations will be supported to provide expertise in marketing, promoting and maximising values of BC's seafood products. 4. Support will be provided to build and maintain a future skilled work force in local and First Nations communities to support commercial fisheries and associated industries 5. The Province will work with First Nations to facilitate restoration and increasing First Nations participation in provincially-led commercial fisheries, including shellfish.
	Area-specific strategies - KDC/MTTC/T/Oweekeno **1.** Opportunities for processing harvested marine plants in local and First Nations communities will be optimized
G. Identify and minimise conflicts between the First Nations and the commercial sport fishing industry.	1. A working group will be established of Federal, Provincial, First Nations and Commercial and Sport Fishing Sector representatives to develop protocols to address issues of concern, discuss co-operative arrangements and to minimize future conflicts 2. Programs will be developed to encourage dialogue and partnerships between all user groups at the community level.
H. Increase the collective benefits to First Nations communities from the harvesting of marine resources under provincial jurisdiction	1. DFO and the province will explore alternative fisheries management approaches with First Nations, including community involvement 2. DFO and the Province will consult with First Nations regarding new species commercialization initiatives with respect to priority allocation and access 3. DFO and the province will work together with First Nations to employ traditional ecological knowledge along with scientific knowledge for resource management purposes 4. First Nations will manage and monitor communal licenses in co-operation with the Province for fisheries under provincial management 5. A First Nations community licensing system will be explored by the Province and First Nation as part of any existing commercial licensing and tenuring programs and new species commercialization initiatives.

Resource/ Interaction	4.10 Marine Transportation & Navigation
Context for Negotiations (Interests / Issues)	• Importance of marine transportation and navigational facilities and services to coastal communities, marine transportation industry, commercial fishing fleet, and marine commercial and recreational boaters. • Importance of expansion of the marine transportation network and provision of more services with greater local control to maintaining and improving economic activities in the area. • Need for maintenance of safe routes and anchorages to support the level of marine transportation and boating activity. • Potential for development and use of transport and navigation facilities, routes and services to impact the marine environment and its enjoyment by recreational and tourism users. • Need for designated routes to confine the transport of dangerous goods, the placement of utility lines, and other potentially disruptive activities to areas where environmental impact can be minimised. • Need to include stakeholders in referrals and planning
Management Intent	1. To develop an integrated marine transportation network for safety, social and economic benefit. 2. To protect and secure the marine navigational system. 3. To promote an environmentally sustainable marine transportation and navigation system.

Objectives	Strategies
A. Maintain and improve local and regional marine transportation facilities and services.	1. Areas with potential for use to expand the network of public harbour facilities, marine fuelling sites, ferry docks and landings will be identified and reserved for development. 2. The formation of local harbour authorities will be considered at suitable sites. 3. Opportunities will be provided for small craft harbours to accommodate large and small recreational vessels. 4. Existing and new harbour services and support facilities will be designed and maintained to meet the needs of all mariners. 5. Removal of marine deposits as part of dredging of harbours and channels and for community uses will continue subject to applicable legislation and regulation.
B. Maintain and improve marine transport and navigation routes and services.	1. Community development plans are encouraged, where applicable, to identify suitable transportation and utility corridors in nearshore and tidal areas, where appropriate and necessary 2. Primary and secondary travel routes (or shipping and boating – large deep draft, medium draft, seine boat or sizeable yacht) will be identified for boaters and marine carriers. 3. Well-maintained and functional navigational aids and safety services should be provided throughout the year, including buoys, staffed lighthouses, weather stations, and flight services.
	Area-specific Strategies - Oweekeno 1. Suitable transportation and utility corridors in nearshore and tidal areas may be identified in detailed marine and coastal land use planning in Oweekeno territory 2. Potential ferry options between Oweekeno traditional territory and Vancouver Island wil be explored with BC Ferries.
C. Minimise the impact of transportation services and routes on the marine and coastal nearshore environment.	1. Impacts from large vessel traffic in the vicinity of marinas and adjacent to upland settlement zones should be addressed using speed limits and other means. 2. Multi-purpose utility corridors should be located to avoid sensitive coastal habitats. 3. Specific corridors will be designated for use for the transport of dangerous or hazardous materials wherever possible 4. The development of environmental management plans in Small Craft Harbour facilities is encouraged

Resource/ Interaction	4.11 Future Integrated Coastal Planning
Context for Negotiations (Issues/ Concerns)	• The existing coastal component of CCLCRMP established a strategic framework for coastal and marine planning • Further coastal planning is needed on the Central Coast at different levels to fully engage all marine interest groups • A system of coastal zonation is yet to be developed • Many data gaps still exist regarding marine species and habitats
Management Intent	1. To develop an integrated coastal management planning process 2. To apply sustainability principles as the basis of coastal zone and marine planning

Objectives	Strategies
A. Address First Nations issues and concerns respecting future integrated planning	1. The Province will develop protocols with First Nations pursuant to enabling processes signed by First Nations and the Province to address issues identified in Appendix I
B. Initiate more detailed coastal planning processes guided by the concept of ecosystem based planning and the precautionary principle	1. Detailed coastal planning will proceed in accordance with Map 2 2. Detailed coastal planning to address long-term use, development and management of coastal lands will be technically driven, developed in conjunction with stakeholders, and will seek to balance ecological and wilderness attributes with recreational, commercial and industrial opportunities. 3. Planning processes will be used that meets and implements planning and resource management mandates of the federal, provincial, local government and First Nations. 4. The more detailed federal planning processes will consider the outline in Appendix III when developing its structure. 5. Government will commit adequate financial and human resources to ensure that data and science issues are fully addressed and that First Nations and stakeholders can fully participate 6. Ensure that future Integrated Coastal Planning is integrated with DFO. 7. Any planning process should include a system of spatial and temporal zones that allows for a variety of activities and will be conducted at an appropriate scale relative to each process. 8. Planning processes should be designed to accommodate the work schedules of commercial fishermen and other stakeholders 9. Data sharing agreements with participants may be included in the development of detailed planning process terms of reference., where appropriate 10. More detailed planning processes may consider potential contributions from the planning area to Parks Canada's National Marine Conservation Area (NMCA) proposal for the Central Coast

5.0 SOCIO-ECONOMIC & ENVIRONMENTAL ANALYSIS IMPLICATIONS

5.1 General Approach

This section addresses plan implications by comparing socio-economic/environmental effects of implementing this coastal zone plan against the anticipated trends under current policy and practices in the absence of a plan. Since there is no coastal zone designation map and strategies are at a strategic level it is difficult to assess specific socio-economic or environmental impacts that would occur as a result of the plan

5.2 Plan Implications

Account	Socio-economic and Environmental Situation and Trends (in absence of plan)	Socio-economic and Environmental Implications of Coastal Strategic Plan
Log Handling Activities	• Government responds to applications for sites as upland harvesting authority is granted. • Log handing tenures are crucial to current and future harvesting operations. • Continued operations in areas may result in impacts to sensitive environments, habitat. • First Nations and local communities have limited influence in referral process, resulting in possibility of conflicts over siting and access. • First Nations have limited employment opportunities in log handling activities	• Requirements for additional studies on environmental impacts of log handling operations may increase industry costs over the short term. • Support for research of innovative methods should support industry operations on nearby terrestrial areas and reduce long term environmental impacts and criticism of practices. • Special management planning for estuaries for protection may affect some existing or planned log handling tenures, requiring new tenures or reducing availability of sites. • Concentration of log handling in specific areas, such as Owikeno Lake, may serve to reduce impacts across the land base but increase site specific impacts; operating costs may increase due to transportation or benefit from concentration of work. • Requirements to restrict operations during salmon and eulachon migration could limit timber harvesting operations in some areas and require additional planning to avoid disrupting log flow to mills. • Improved opportunities for First Nation and local community input may reduce potential conflict. • Greater involvement by First Nations will increase local employment benefits. • Requirements for more detailed coastal planning will lead to identification of sites in advance of harvesting activities and will help to resolve conflicts.
Aquaculture (Finfish and Shellfish)	• There are over 50 salmon & 4 shellfish farms in the Plan Area, about 47% of provincial total. • 640 (mainly year round) direct jobs, most of which are on north VI. • Freeze on number of tenures in BC at 121, with provision for 10 additional salt & fresh water pilot projects for closed containment	• Direction largely parallels newly developed provincial salmon aquaculture guidelines. Effect of plan is consequently limited. • Direction for independent monitoring of finfish aquaculture operations will add to operational expenses but there should also be some benefits, e.g. increased public trust and reduced environmental impact.

Account	Socio-economic and Environmental Situation and Trends (in absence of plan)	Socio-economic and Environmental Implications of Coastal Strategic Plan
	research. Relocation of priority sites • Output has grown strongly despite tenure freeze. • World markets for farmed salmon & shellfish expected to grow strongly. Substantial unutilised areas for industry expansion, if freeze removed. • Some First Nations & other interest groups oppose expansion of salmon farming due to concerns about environment & other issues. • Farmed fish escapes and the perceived potential for disease transfer are major factors in opposition to existing operations. • Some aquaculture activities limit access to public foreshore and uplands	• Direction for improved practices, monitoring and conversion to closed containment may reduce environmental impact of aquaculture operations. • Direction for conversion to closed containment finfish operations may impose additional economic burden on some operators. • Emphasis on escape prevention should reduce the spread of exotic species along the BC coast • Provincial support for First Nations co-operative ventures could improve economic opportunities for First Nations • Requirements for more detailed coastal planning will help in the identification of appropriate sites and aid in the resolution of conflicts, particularly those concerning access.
Sport Fishing Lodges	• The approximately 50 lodges in the area primarily serve outside clients and employ non-residents, purchase goods and services from outside the Plan Area. • Sport fishing accounts for 1/3 of tourism jobs, but constrained by declines in salmon stocks. • Potential for increased fishing pressures concentrated in key areas. • Diversification of lodge activities to include other tourism opportunities, e.g. Grizzly bear viewing, etc. • Increasing conflict between lodge operators and First Nations conducting food fisheries, shellfish harvesting and other activities	• Requirements for environmental assessments may increase short term costs to operators but could increase long term stability of industry • Efforts to develop strategies to control unlicensed mobile sport fishing operations may reduce fishing pressure in heavily visited areas but requires federal participation. • Recommendations for local employment and local purchase of supplies may aid economic diversification in coastal communities • Establishment of working groups to address outstanding issues may serve to reduce conflicts. • Requirements for more detailed coastal planning will help to identify appropriate sites and aid in the resolution of conflicts in advance of development.
Settlement	• Unauthorized float homes can limit access to traditional shellfish harvesting areas and other resource activities, may cause local pollution concerns. • Remote operations are expected to continue to make use of float homes and other infrastructure	• Tenure requirements for work-related tenures in remote locations may reduce the number of unauthorized float homes. • Tenure requirements can be used to reduce potential for pollution. • Requirements for more detailed coastal planning will aid in the resolution of conflicts in advance of tenuring.
Energy and Minerals	• Current employment is minimal, but there is a proposal for an aggregate quarry near Bella Coola that would create ~40 jobs • Present provincial and federal moratorium on offshore oil and gas exploration limits development opportunities, avoids any risk of environmental impacts. • Concerns of First Nations and local communities regarding employment, potential pollution, lack of consultation.	• Clear direction for consultation with First Nations and public if any change to moratorium considered. • Recommendations for greater First Nation and local community employment can aid economic diversification of coastal communities. • Direction for minimizing future environmental impacts and remediation of existing contaminated sites where required will add to operational costs for developers but reduce risk to other resource values. • Mining industry likely to view incremental management as onerous • Support for alternative energy research may foster economic

Account	Socio-economic and Environmental Situation and Trends (in absence of plan)	Socio-economic and Environmental Implications of Coastal Strategic Plan
		development and reduce environmental impact from current energy sources. • Requirements for more detailed coastal planning will aid in the resolution of conflicts in advance of development.
Recreation & Tourism	• Plan Area offers high quality recreation opportunities such as boating/kayaking, back-country hiking, hunting. • In 1996, tourism (includes business travel) accounted for 16% of local jobs (~ 320 part and full-timejobs) & 10% of income. Census data indicates growth, but recent sport-fishing declines. • Limited economic benefit to local communities and First Nations • Some coastal values may decline due to log dumps & if cap on salmon farms lifted; protection of key features of concern • Commercial tourism/business travel likely to continue gradual growth for foreseeable future, but highly dependent on sport fishing activity. • Growth in eco-tourism activities provide for greater diversity in industry, more opportunities for enterprise and reduced dependence on sport fishing • Activities in the Hakai have been declining since a peak in the mid-1990s	• Consideration of key recreation and tourism features (i.e. dive sites, public access to beaches, etc) and maintenance of access for key anchorages provides for sector stability. • Emphasis on biophysical capability assessments related to future tenures/opportunities may limit some development but addresses issues of long term sustainable management • Additional requirements re: siting suitability of sport fishing lodges may deter some investment. • Direction regarding inclusion of First Nations in activities in their traditional territories may be beneficial economically for isolated communities. • Improved inventory will inform local planning, permitting better use of available resources • Support for communications between industry and First Nations will reduce tension over access to sites, resources. • Requirements for more detailed coastal planning will aid in the resolution of conflicts in advance of resource allocation.
Environmental Quality	• Concerns regarding declining water quality and impact of shellfish harvesting near popular anchorages, communities and resorts. • Abandoned industrial development sites have the potential to release contaminants into both marine and terrestrial environments • Increasing tourism and freight shipment along Inside Passage increases the possibility of oil spills in confined Central Coast waters	• Direction requiring strict clean up, pollution prevention associated with resource development will minimise related pollution. • Direction focused at reducing the impact of tourism operators and recreational users will limit impact in high use areas. • Direction aimed at increased monitoring and research into First Nation traditional food sources may result in improved standards of health in these communities
Marine Protection Areas	• No formal direction on management of resource activity within marine protection areas, excepting Hakai and Fiordland. • Lack of formal direction to identify candidate protection areas could result in inadequate representation of marine ecosystems. • No role for local communities or stakeholders in management of protection areas • Degradation of important recreation, tourism and cultural features and sites • Hakai area will continue to be a controversial issue with the Heiltsuk	• Direction for socio-economic impact assessments prior to protection area designation provides opportunities to avoid or mitigate local impacts as well as identification of ways to benefit communities. • Local community involvement in protection area management. • Mechanisms to address economic impact to commercial fishermen and sports fishing operators. • Establishment of no-take reserves may assist with species recruitment and habitat protection, providing greater stability for commercial harvesters while supporting species diversity. • Heiltsuk Conservancy network will increase Heiltsuk support for MPAs

Account	Socio-economic and Environmental Situation and Trends (in absence of plan)	Socio-economic and Environmental Implications of Coastal Strategic Plan
	• First Nations will continue their general opposition to MPAs in the absence of meaningful roles and safeguards	• MPAs established with full support of First Nations • More detailed coastal planning will reduce conflict between users groups
Coastal and Marine Biodiversity Conservation	• No formal direction for management of activities in estuaries and other key habitats could result in loss of critical wildlife areas. • Gaps in coastal resource data set increases possibility of losing critical wildlife habitat • Introduction/arrival of harmful exotic species may impact native stocks	• Estuaries identified for management plans. • Classification and mapping of coastal nearshore habitat and prioritisation of restoration/enhancement projects will improve management of key wildlife areas. • Direction to avoid species disturbance during key lifecycle events will reduce impacts to herring, eulachon and other species under stress.
Coastal Fishery and Marine Plant Management	• Although fishing is a significant economic generator for coastal communities and First Nations, it is beyond provincial jurisdiction for management/allocation purposes. • Insufficient collaboration between provincial and federal authorities may impact sustainable management • In 1996, fishing/processing provided almost about 300 jobs and 8% of income in the Plan Area. • Fishing/processing resident jobs have declined significantly since 1996 due primarily to salmon harvest declines & buyback. • Non-salmon species have become more significant as income sources. • Bottom trawling may compromise benthic ecosystems such as those associated with subtidal rock reefs. • DFO moving to greater use of advisory boards to provide management recommendations • Resourcing for fisheries enforcement programs is limited	• Increased support for First Nation and local community economic diversification, marketing of products • Direction for improved inventory and analysis of fishery and marine plant resources will assist more effective management. • Direction for increased Provincial consultation with First Nations regarding marine plant harvesting will ensure that First Nations requirement are addressed in advance of commercial operations • Fisheries management not addressed by plan due to DFO responsibility, overall impact of plan therefore neutral. However plan recommends structures and processes that may lend to satisfactory resolution of fisheries issues with First Nations. • Maintenance of safe anchorage network provides for continued access to areas by fish boats. • Increased DFO reliance on stakeholders and advisory groups to influence management. • Potential for increased enforcement, including community policing and greater First Nations participation.
Marine Transportation and Navigation	• Transportation services to coastal communities may suffer reductions • Trend towards off loading maintenance of transportation services and facilities to coastal communities • Occasional conflicts between transportation routes and tenure proposals	• Designation of hazardous materials route will limit impacts of accidents • Formation of local harbour authorities will provide opportunities for economic development and greater local control of transportation related activities
Future Integrated Coastal Planning	• No formal mechanism for integrated planning could result in greater conflict between resource users and inefficient allocation of resources. • Strategic coastal planning does not address specific tenure related issues for industry, First Nations and local communities.	• Local scale coastal planning will support economic diversification and sustainable development • Identification of roles for local governments, stakeholders and First Nations provides for local involvement in planning
Community Concerns	• 50% of Plan Area residents live in the Bella Coola Valley, with another 25% in the Bella Bella area. • Main economic drivers are forestry, fishing, tourism,	• Impact of plan expected to be limited due to absence of restrictive zoning and the fact that commercial fishery management is under federal jurisdiction.

Account	Socio-economic and Environmental Situation and Trends (in absence of plan)	Socio-economic and Environmental Implications of Coastal Strategic Plan
	aquaculture, but most of the employment & other benefits from these resource sectors accrue to non-local residents - lack of economic control is a key concern of those in the Plan Area. • Slow economic & population growth expected. Opportunities appear to be mainly in forestry, tourism, & aquaculture sectors. Reduced timber harvests expected in short & long term, even without a land use plan. • Treaty settlements & Delgamuukw precedent could result in greater local control over natural resource development & related benefits. • Communities on north & mid-VI (where the local economy is also currently poor) & the Lower Mainland partly rely on Plan Area resources.	• Economic opportunities may expand due to opportunities for diversified development in coastal areas, assuming market conditions warrant.
First Nations	• First Nations comprise >50% of Plan Area resident population. Other groups on northern VI also claim territories in Plan Area. • In 1996, 30% of Plan Area on-reserve labour force worked in fishing & forestry. This has since declined due to economic difficulties in these sectors. • Key concerns are sustainability of fish/wildlife, extremely high unemployment rates, lack of training/capacity, lack of control over and low, local benefits from land & resources. • Future treaty settlements will likely include financial compensation, encourage joint ventures & increase economic stability in the Plan Area. • Without the CCLCRMP agreement on terrestrial land use, environmental market campaign could reduce First Nations forestry employment.	• Historic lack of benefits to First Nations communities although plan does encourage developers and existing operators to provide local opportunities for employment. • Potential long term increase in tourism jobs & livelihoods derived from nature-based activities such as fishing, eco-tourism • Potential interim economic measure agreements with First Nations resulting from Enabling Process discussions could increase employment and general economic conditions for Plan Area First Nations • Development of collaborative management agreements on marine protection areas may protect First Nations employment opportunities and provide increased protection for cultural heritage resources

5.0 PLAN IMPLEMENTATION, MONITORING & AMENDMENT

5.1 General Provisions

Provincial government agencies with legislated responsibility for management of land and resources will implement the Central Coast Coastal Zone Strategic Plan through detailed plans, resource development permits, protection of sensitive environmental or unique marine environments and land adjudication decisions. More detailed plans are expected to describe linkages with the Coastal Zone Strategic Plan and include an explanation of how they are consistent with and contribute to implementation of the plan.

The management intent in the Coastal Zone Plan will be reflected in resource management and development activities subsequent to the approval of this plan.

The term of the Coastal Zone Strategic Plan is ten years. The objectives and strategies in the Coastal Zone Strategic Plan may be amended in accordance with section 6.3.

5.2 Roles and Responsibilities for Government

Provincial government agencies will clarify and confirm management actions and agency responsibilities for implementation of the Coastal Zone Strategic Plan. Management activities will be consistent with legislative mandates and will be incorporated into existing or new programs. Agencies will establish a schedule for review and revision of current detailed plans. Agencies will ensure that the Coastal Zone Strategic Plan is available to licensed resource users, resource agency staff, stakeholders, First Nations and interested public.

5.3 Plan Monitoring and Amendment

A monitoring committee will be established to provide community liaison and inform the public about implementation of and changes to the Coastal Zone Strategic Plan. The committee will be chaired by MSRM Vancouver Island Region and will include representatives of First Nations and local governments as well as staff from provincial and federal agencies. The primary task of the monitoring committee will be the development of an implementation strategy that will guide the integration of plan recommendations with existing agency policies and procedures.

More detailed planning, through mapping, research or public involvement, may recommend updates to the Coastal and Marine Strategic Plan. These proposed updates will be referred to the Monitoring Committee for review. Written recommendations of a minor nature will be reviewed by the regional representatives of MSRM and DFO who will, if in agreement, amend the Coastal Zone Strategic Plan. Major amendments in policy and/or procedures will continue to require the approval of the appropriate Ministers. A rewrite of the plan document will be directed when the number of amendments required warrants such action.

Appendix I: First Nations Issues and Concerns on Land and Coastal Management

A.	First Nations issues and concerns respecting consultation on land and resource development	• Establishment of clearing houses for development proposals to the First Nations • Provision of technical support • Development of protocols with agencies regarding application timing windows • Mutually agreeable time frames (e.g. timing windows) with individual provincial agencies. • Protocols s with agencies on referral content and required supporting documentation. • Provision of financial resources. • Mechanisms for addressing First Nations issues and concerns in a mutually satisfactory way • Opportunity for First Nations to meet with government and/or proponents to discuss development proposals. • The nature and type of the tenure applications covered in the protocol. • Mechanisms for determining terms of reference and expertise required for studies to accompany development proposals, within confines of existing legal requirements
B.	First Nations issues and concerns respecting cultural and heritage resources	• Role in review and amendment of relevant legislation and policy • Protection of cultural sites and features • Role in managing cultural features • Management of culturally modified trees • Terms of reference for archaeological impact and overview assessments • Fund for identifying culturally modified trees • Buffer zones for Culturally modified trees • Inventory of underwater heritage sites • Role in development and management activities for sacred sites, cultural sites and burial sites. • Role in the management of known burial sites • Monitoring program for burial sites and sacred places • Identification and repatriation of human remains, and reserving of sites through the use of the Land Act or federal legislation • Guardian program, archaeology field specialists, site resource managers, and provisions for training and resources • Change of selected place names to their aboriginal names.
C.	First Nations issues and concerns respecting land and coastal tenures	• Role in review and amendment of relevant legislation and policy • Siting criteria and land use capability determinations • Criteria used to perform sub-tidal and inter-tidal assessments required of tenure applicants for referral purposes • Collaboration on more detailed land allocation planning and marketing • Collaboration on, and development of tenure management plans • Review of problematic tenures • Collaboration on the development of standard information requirements for tenure assessments • First right of refusal on tenures within a traditional territory(Oweekeno): float homes • Issuance of and timing windows for tenures in or affecting known eulachon spawning grounds and juvenile rearing areas • Involvement in implementation of the provincial commercial recreation policy • Notification and involvement in disposition of Crown Land, including sale
D.	First Nations issues and concerns respecting log handling	• Role in review and amendment of relevant legislation and policy • First Nations involvement in impact studies • Siting criteria, minimum setbacks and mitigative actions (ex. Avoidance of impacts to shellfish beds) • Prevention and clean up of sunken logs and debris
E.	First Nations issues and concerns respecting finfish aquaculture.	• Role in review and amendment of relevant legislation and policy, including violation of standards • Role in siting criteria, identification of sites and moratoria • The scope and pace of development in individual traditional territories • Role in monitoring, including the Atlantic Salmon Watch Program • Non-salmonid finfish farming • Farming of indigenous species • Siting and criteria for pilot studies • Escape management and recovery plans

Appendix I: First Nations issues and Concerns on Land & Coastal Resource Management

	• Information sharing agreements
F. First Nations issues and concerns respecting shellfish aquaculture	• Role in review and amendment of relevant legislation and policy • Role in siting criteria, identification of sites • The scope and pace of development in individual traditional territories • Identification of priorities for remediation of contaminated shellfish growing areas • Role in developing terms of reference for feasibility studies • Identification and avoidance of wild shellfish sites • Areas for First Nations exclusive shellfish aquaculture use • Collaborative management • Role in monitoring
G. First Nations issues and concerns respecting sport fishing lodge tenures	• Role in review and amendment of relevant legislation and policy • Role in siting criteria, identification of sites and more detailed planning • The scope and pace of development in individual traditional territories • Collaborative management • Role in monitoring • Role in land use capability studies and environmental assessments • Identification of problematic or contentious sport fishing lodge tenures • Revenue sharing or fee collection from sport fishing lodges within traditional territories
H. First Nations issues and concerns respecting settlement and resettlement activities	• Role in review and amendment of relevant legislation and policy • Role in identification of sites for settlement activities and related infrastructure • Resettlement opportunities • Permit and tenuring systems • Planning, development and provision of necessary infrastructure • Desirability and siting of float homes communities
I. First Nations issues and concerns respecting energy and mineral development	• Role in review and amendment of relevant legislation and policy • Role in management and regulation of mineral and energy exploration and development • Role in any review of the offshore oil and gas moratorium • Role in more detailed energy and mineral planning • The scope and pace of development in individual traditional territories • Role in monitoring and enforcement • Revenue sharing from mineral exploration and development activities within traditional territories • The provision of sub-surface rights • Standards for clean up and remediation • Role in environmental and risk assessment review • Role of province in the promotion of First Nations employment and training opportunities • Involvement of First Nations in exploration, development and restoration activities by industry • Identification of abandoned mine sites requiring remediation
J. First Nations issues and concerns respecting recreation and tourism activities	• Role in review and amendment of relevant legislation and policy • Measures to protect cultural heritage sites from tourism/recreation impacts • Trespassing, garbage and littering, pollution and other negative impacts associated with public recreation including visitor control and damage deposits • Inventory of recreational sites and features, and education and data distribution programs • Design and develop a comprehensive recreation and tourism management plan • Criteria for identifying and classifying potential resort sites • Role in environmental capability studies for future commercial recreation and tourism opportunities. • Role in identifying and incorporating linkages between foreshore based tourism facilities and upland tourism opportunities. • Development of existing wildlife viewing criteria • Reservation of commercial recreation sites for First Nations use

Appendix I: First Nations issues and Concerns on Land & Coastal Resource Management

	• Letter of First Nation support as a condition of commercial recreation and tourism tenure • Priority for joint venture applications involving First Nations (i.e. weighting of criteria) • Collaboration on development and distribution of educational material and programs • Written consent for visiting cultural heritage sites in commercial recreation and tourism operations • Notification when operating in First Nations territory • Role in monitoring and enforcement • Right of first refusal on commercial tenure opportunities • Role in review and selection of classified waters for angling • Role in determining appropriate activities and management strategies for classified waters • Opportunities for co-operative ventures with industry
K. First Nations issues and concerns respecting environmental quality.	• Review and amendment of relevant legislation and policy • Regulation of hot water discharges, sewage effluent and pulp mill discharges (KDC/MTTTC/T) • Development of standards, controls or guidelines to address the introduction and control of exotic species • Reviewing pesticide use • Monitoring and enforcement of litter and waste management from tourism and recreation operations • Use of "salt" (i.e. calcium chloride) on logging roads
L. First Nations issues and concerns respecting coastal and marine and terrestrial protection areas	• Identification of additional areas • CCGAT Goal I and II areas • MPA network • Management of designated areas, including interim management areas
M. First Nations issues and concerns respecting coastal and marine biodiversity conservation.	• Role in review and amendment of relevant policy and legislation • Involvement in development and conduct of studies of terrestrial species and habitat • Development of management plans for critical estuaries • Development of criteria for the development of standards for the assessment and inventory of coastal nearshore habitat • Role in identification, mapping and planning at more detailed levels of coastal nearshore areas with priority for habitat restoration and/or enhancement • Involvement in studying species distribution
N. First Nations issues and concerns respecting coastal fishery and marine plant management.	• Management of marine flora and fauna utilised for food, social and ceremonial purposes • Review of Provincially administered marine fisheries abundance levels • Resource allocation and decision making regarding maintenance of access and harvesting rights • The harvest of aquatic plants and algae harvest permits being issued to others • Marine data sharing agreements, collection and analyses of information for Provicially administered recreational fisheries • Creation of standards to be developed for fishery inventory and analysis (provincially administered) • Facilitate restoration and increasing participation in provincially led commercial fisheries • First priority /right of refusal for communal licenses for new Provincially administered species commercialisation initiatives • Management of Provincially administered communal licenses • Community licensing system as part of any existing commercial licensing and tenuring programs and new species commercialisation initiatives. • Provision of confiscated marine resources to First Nations • Role in processes to establish conservation limits and guidelines.
O. First Nations issues and concerns respecting future integrated planning	• First Nations role in coastal and marine planning • Collaboration and resourcing of an Oweekeno land use and economic development plan. • Priority areas and planning boundaries • Development of mechanisms to ensure future plans meet the social, cultural and economic needs of First Nations • First Nations role in monitoring • First Nations role in implementation of plans and coastal resource management • Information protocols • Provisions of technical and financial support for First Nations to participate in planning processes

Appendix I: First Nations issues and Concerns on Land & Coastal Resource Management

P. First Nations issues and concerns respecting forestry and timber management	• Role in review and amendment of relevant legislation and policy • Designation of landscape unit planning boundaries that reflect First Nations traditional territories • Rate of cut determination, including culturally important tree species • Role in management of forest resources (including monitoring and enforcement) • Delineation of the timber harvesting land base • Increasing social and economic benefits from forestry development • Priority access to timber supply, including access to timber for industrial, social and ceremonial purposes and community salvage • Role in inventorying culturally significant tree species • Identification of timber harvesting opportunities, including access to 5% take-back volumes, communal forest tenures, direct award of timber sales in the small Business Forest Enterprise program, and woodlots • Opportunities for increasing the number of woodlot licenses availability to individual First Nations • Identification and prioritisation of areas of culturally important tree species, particularly cedar, for traditional use • Role in results based regulatory framework • Transfer of lands and harvesting rights • Role in mitigating impacts on plants used for medicinal, food social, or ceremonial purpose • Revenue sharing
Q. First Nations issues and concerns respecting botanical products	• Role in review and amendment development of relevant legislation and policy • Role in management of plants used by First Nations for medicinal, food, or ceremonial purposes • Role in lower level planning initiatives • Role in the development of community level educational programs, permitting systems and monitoring • Role in identification, management and allocation of yew • Role in the development and use of innovative technology • Role in the regulation of botanical forest product harvesting • Protection of significant medicinal and food plant harvesting areas • Access to areas for plant harvesting • Role in the management of cedar for cultural purposes • Identification of ecosystems supporting botanical products • Development of botanical products information to assist licensee planning • Review of pesticide use applications in areas of First Nations botanical harvesting • Role in processes to establish conservation limits and guidelines
R. First Nations issues and concerns respecting visual quality	• Role in review and amendment of legislation and policy • Role in inventory of viewsheds • Role in identification and periodic review of visually sensitive areas • Role in assessment of forest harvesting practices in visually sensitive areas • Role in identification of rivers requiring visual buffers • Role in establishing VQO's
S. First Nations issues and concerns respecting the management of riparian and fish habitat.	• Role in review and amendment of relevant legislation and policy • Role in review of forestry assessments (CWAPS, etc.) • Role in monitoring riparian management practices, including effectiveness monitoring • Role in management of freshwater fisheries and aquatic resources, including stock assessments • Role in developing and applying adaptive management principles to riparian and fish habitat management • Role in restoration and enhancement projects • Role in the incorporation of fish protection measures into lower level planning • Role in the identification and protection of environmentally sensitive and critical fish and wildlife habitat • Role in the management of wildlife trees in riparian management areas • Role in monitoring and ensuring the appropriate retention of softwood and hardwood tree species along S1, S2, S3 and S4 rivers and streams • Role in the development of inventory standards for sensitive marine aquatic inventories and marine sensitive zone designations and

	completion of related work • Role in identification, monitoring and protection of marine sensitive zones • Role in the development of KSW methodologies
T. First Nations issues and concerns respecting the management of terrestrial biodiversity conservation.	• Role in review and amendment of relevant legislation and policy • Review and revision of draft landscape unit boundaries • Review and assignment of interim biodiversity emphasis options • Role in landscape unit planning • Role in definition and application of multi-rotation planning • Role in management of coarse woody debris • Role in biodiversity related research • Role in joint sign-off of forest development plans • Role in site series level management in specific landscape units
U. First Nations issues and concerns respecting the management of water	• Role in review and amendment of relevant legislation and policy • Role in the management of water resources • Role in the issuance of water licenses and approvals • Role in the identification, reservation and management of traditional and licensed First Nations water use diversion points • Information sharing regarding First Nations traditional water use diversion points • Application of water quantity and quality protection measures • Role in development and implementation of water quality monitoring programs • Role in and consultation regarding the maintenance or construction of existing or new flood protection works and dams • Role in any review of the bulk water export moratorium • Economic development opportunities related to water resource use
V. First Nations issues and concerns respecting the management of terrestrial biodiversity conservation	• Role in review and amendment of relevant legislation and policy • Review and revision of draft landscape unit boundaries • Review and assignment of interim biodiversity emphasis options • Role in landscape unit planning • Role in definition and application of multi-rotation planning • Role in management of coarse woody debris • Role in biodiversity related research • Role in joint sign-off of forest development plans • Role in site series level management in specific landscape units
W. First Nations issues and concerns respecting wildlife and wildlife habitat management	• Role in review and amendment of relevant legislation and policy • Role in wildlife habitat management • Role in identification and inventory of critical habitat, including habitat requirements for red and blue listed species • Role in management of development activities to retain key habitat features at all planning levels • Access to wildlife species traditionally hunted by First Nations • Review of hunting regulations affecting First Nations harvest • Access to confiscated wildlife or those killed due to human safety issues • Identification and management of First Nations exclusive hunting areas • Determination of annual hunting limits • Role in maintaining wildlife inventories • Establishment of First Nations-only hunting areas • Role in enforcement and monitoring of hunting regulations • Involvement in review of conservation policies and harvesting limits • Development of educational programs to reduce avoidable wildlife death • Revenue sharing from hunting permits • Commercial furbearer farming licensing • Incorporation of First Nations TEK, oral histories and traditions into wildlife management decisions

Appendix I: First Nations issues and Concerns on Land & Coastal Resource Management

	• Provision of confiscated wildlife to First Nations
X. First Nations issues and concerns respecting grizzly bear management	• Role in review and amendment of relevant legislation and policy • Management of grizzly bears • Role in determining critical grizzly bear foraging habitat mitigation and restoration requirements • Role in monitoring grizzly bear mortality • Role in reducing avoidable bear mortality • Involvement in improving human safety concerns and education on bear-garbage interaction management • Access management planning in key grizzly bear habitat • Review of grazing permits in grizzly bear areas to avoid human-bear conflicts • Role processes to establish conservation limits and guidelines
Y. First Nations issues and concerns respecting management of trapping and guide outfitting activities	• Role in review and amendment of relevant legislation and policy • Role in guide outfitting and trapping activity management • Role in issuance of new guide outfitting and trapping tenures and permits, including communal trapping permits • Role in standardising federal and provincial trap line accounting systems • Monitoring of trapping and guide outfitting activities and maintenance of accurate records and maps • Development of a guide outfitter tenure compliance and review process • Distribution of information on trapping and guide outfitting activities within traditional territories • Access to unencumbered traplines (first right of refusal) • Retirement of inactive non-aboriginal trapline tenures • Promotion of sustainable fur harvesting practices • Sharing of fur harvest information • Revenue sharing • Issuance of commercial farming licenses, tenures or permits for furbearing animals • New trapping opportunities where traplines are impacted by resource development • Role in processes to establish conservation limits and guidelines
Z. First Nations issues and concerns respecting road management	• Role in review and amendment of relevant legislation and policy • Role in access management planning and decision making, including minimising impacts to wildlife habitat, road de-activation and evaluating requirements for permanent road infrastructure • Role in monitoring impacts of road and stream crossing construction, maintenance and use on fish and fish habitat • A compliance enforcement strategy to manage road and stream crossing impacts • Review of outstanding concerns regarding existing forestry access roads

Appendix II: Outline for the Development of Federally-led Integrated Management Plans

Canada's Oceans Act calls for the development of integrated management plans for Canada's marine waters. This entails the development of IM plans for large ocean management areas, including coastal and offshore components, and the development of IM plans at the coastal community level. Community level IM plans can be nested within the large ocean management area plans.

The guiding principles for achieving a collaborative approach to integrated management are (as outlined in the Oceans Act):
1) the precautionary approach (erring on the side of caution);
2) sustainable development;
3) integrated management of coastal and marine activities (establishing effective governance processes).

Supporting principles include
1) an ecosystem approach to management (for the maintenance of biological diversity and productivity);
2) a collaborative approach;
3) building on existing efforts (e.g. CCLCRMP; local planning processes);
4) use of scientific and traditional knowledge;
5) an adaptive management approach.

Prioritizing for regional initiatives will depend on resource constraints and area needs; factors include:
- Stress on the environment (ecosystem health)
- Capacity to work in the area (knowledge, community support, resources within agencies)
- Projected increase in existing activities (e.g. aquaculture, ecotourism)
- Forecast for new activities (e.g. oil and gas), and associated environmental impacts and user conflicts

Plans
The IM plans for large ocean management areas can address large-scale ecosystem and multiple use issues, and overall marine environmental quality issues, including:
- Ecosystem objectives (e.g. maintenance of ecosystem diversity, ecosystem structure and function, genetic variability, etc.)
- Geographic ocean space allocation issues (including zoning) (e.g. cables; shipping; species-at-risk; oil and gas; marine tourism, etc.) and international issues
- Will provide guidance for community based initiatives nested within the larger area
- Will provide context for, and identify, Marine Protected Areas
- Will identify and assess broad economic opportunities

The IM plans at the coastal community level can deal primarily with matters of a local nature and address issues at the land-water interface, including:
- Land-based sources of pollution, habitat degradation and climate change (e.g. implementation of National Program of Action for Protection of the Marine Environment from Land-based Activities)
- Local ocean space allocation issues (e.g. aquaculture, tourism)
- Provide context for, and identify, Marine Protected Areas
- Community stewardship initiatives
- Engagement of regional/local governments and aboriginal groups (e.g. land-planning authorities; harbour authorities)
- Economic diversification opportunities (e.g. eco-tourism)

Integrated Management `lans and Integrated Fisheries Management Plan Interactions
Space Allocation and Zoning including:
- Assess and address impacts of fishing gear types and methods in areas of habitat sensitive to benthic disturbance

- Identification of overlapping interests (e.g. oil & gas and fishing)

Conservation and Ecosystem Management, including:

- Establishment of Marine Environmental Quality regulations to prohibit/reverse degradation of important fisheries
- Recommendations on multi-species and food-web interactions (ecosytems objectives)
- Establishment of MPA for fisheries sensitive habitat (e.g. spawning grounds) for species protection and recovery

Note: IM Plans and IFMPs will be cross-referenced to ensure complementarity.

Process

A common process will be applied to all large-scale and community level IM plans, including the following steps:

- Define ecosystem boundaries; compile ecological overview; existing and potential use audit; identify knowledge gaps and issues; initial rational for IM process
- Identify and engage affected parties/interests; review existing governance structures and commit to cooperative action
- Planning bodies address issues and essential knowledge gaps; set goals, objectives and priorities; establish roles; develop management plan
- Establishment of advisory or management bodies as appropriate
- Management body (regulatory and others) commits to adopt and implement the plan
- Monitor and revise plan as required

Planning Tools

IM plans can be implemented using a variety of tools, including:

- Existing authorities in the Oceans Act (e.g. MPA regulations, MEQ guidelines, objectives, criteria)
- Existing authorities in the Fisheries Act (e.g. fishing closures)
- Other federal, provincial, local government regulations in accordance with existing mandated responsibilities
- Existing authorities established by legislated Land Claims Agreements
- Through voluntary actions by land-based and ocean users
- Existing management structures will be used wherever possible (e.g. Harbour Authorities, Biosphere Boards, Co-management Boards)

Sample Structure of an Integrated Management Plan

1. Terms of Reference (including description of process)
2. Strategic Direction for Management
   - Vision statement
   - Goals
   - Long-term and short-term objectives for management
3. Ecosystem Overview
   - geographic and habitat classification
   - conservation status
   - access and regional context
   - archaeology
   - written and oral history
   - recent developments; current and emerging human use and development
   - socio-economic context
   - physical features
   - climate
   - plant and marine life
   - Description of Management Issues (e.g. historic and current; pollution; future demands; potential conflicts)
4. Management policies
   - Resource Units
   - Management Objectives and Strategies (general and zone specific
   - Zoning

5. Education and Interpretation (describes programs and cooperative arrangements to promote protection, wise use, public understanding, and enjoyment of oceans and coastal management area. Co-management may be an option.
6. Compliance Mechanisms (surveillance, monitoring, enforcement)
7. Maintenance and Administration (budget, staffing)
8. Information Sources
9. Appendices, e.g
   - Boundary and Area Description
   - Legislation
   - Plant, Animal Species
   - Special Features
   - Past, Present and Proposed use
   - Map

Appendix III List of Participants

Jim Abram	Comox Strathcona Regional District
Andrew Andy	Nuxalk First Nation
Tom Bird	Sport Fishing Institute of BC
John Bones	LUCO
Lewis Bublé	Independent Fisherman
Richard Dawson	Mugamagw Tsawataineuk Tribal Council
Robert Germyn	Heiltsuk First Nation
Gordon Goodman	MSBTC
Dale Gueret	Fisheries and Oceans Canada
Chris Hamilton	BC Parks
Cliff Hanuse	Oweekeno First Nation
Scott Harris	Kwakiutl District Council
Bill Henwood	Parks Canada
Fern Hietkamp	Fisheries and Oceans Canada
Philip Hogan	Heiltsuk First Nation
Don Howes	LUCO
Frank Johnson	Oweekeno First Nation
Kris Kennett	BC Parks
Brian Lande	UFAWU/T Buck Suzuki
David Lane	UFAWU/T Buck Suzuki
Jennifer Lash	Living Oceans Society
Craig Murray	Nimmo Bay Resorts
Tom Nelson	Kwakiutl District Council
Earl Newman	Bella Bella Fish Co.
Ray Pillman	Outdoor Recreation Council
Stan Price	Weyerhaeuser
Cecil Reid	Heiltsuk First Nation
Kevin Smith	Marine Tourism
Darol Smith	IWA 2171
Dallas Smith	Tlowitsis Nation
Joe Truscott	BC Fish
Mark Zacharias	LUCO
Graem Wells	Central Coast Regional District
Duncan Williams	BCALC

C1- Whale Channel-Fraser Reach

Physical and Oceanographic Description

This planning unit extends from a sill at the confluence of Whale and Squally Channels on the western boundary and includes all of Princess Royal Channel to the sill on Tolmie Channel. This unit also includes Hiekis Channel on the eastern boundary, effectively including the northern portion of the waterways adjacent to Princess Royal Island. Most of the upland terrain is steep except for outer Whale Passage. Surface temperature ranges from 12.5°C in summer to 5.0°C in winter. Surface salinities for this unit are expected to average 24 parts per thousand (ppt) with a short term variability of <3 ppt. Exposure is most extreme on the south west areas, with polar outflows generating wave heights to 360 cm in southern Whale Passage and to 240 cm in McKay Reach. This is moderated in Princess Royal Passage with wind waves ranging from an average of 100 cm in the summer to a maximum of 240 cm from the south in the winter. Whale Channel and McKay Reach experience maximum water currents of 100 cm/s in the main channel, and approximately 75 cm/s on the sides of channel with some estuarine flow. In southern Princess Royal Channel there is substantial freshwater input at Green Inlet from the Green River, and currents generally range from 25 to 50 cm/s except near the southern sill. Princess Royal Channel and McKay Reach form part of a heavily used marine transportation route and bow waves are a potential navigation hazard. Slopes are steep throughout much of the transitional waterway areas, and slides are a serious problem in Green Inlet. Avalanche chutes lead directly onto the channel surface throughout the region. The slopes of the deep channels below the water surface are also very steep and, as a result, creek mouth delta fans built out onto them are potentially unstable.

Biological Resource Values

Birds: Aaltanhash Inlet supports over-wintering goldeneye and surf scoter populations. High concentrations of Marbled Murrelets found in Khutze, Aaltanhash and Klekane Inlets with moderate concentrations found in the Fraser – Graham Reach area and on the eastern side of Princess Royal Island in Laredo Channel.

Marine Mammals: In Whale Channel there are reported populations of Humpback, Finn, Minke, and Sei whales, Pacific White-sided dolphins, and Dall's porpoises. There are Stellar's sea lion haulouts on Aston Island, and which also supports wintering Fur seals. In Princess Royal Channel transient Orcas, Risso's dolphins and Dall's porpoises have been reported. The area also supports wintering Fur seals, sea lions and several seal haulouts along Fraser Reach (Ricker, 1995).

Red and Blue Species: There is a single unranked site in this unit.

Herring Spawn: Herring spawn occurs at the heads of Khutze, Klekane and Aaltanhash Inlets as well as the southern portion of Barnard Harbour.

Human Resource Use

Commercial Sea Cucumber Fishery: Commercial sea cucumber harvesting occurs at the south end of Graham Reach, north Finlayson Channel and Green Inlet. Harvesting generally occurs during January and February.

Commercial Crab Fishery: Dungeness crabs are harvested in Barnard Harbour (July-December) and Khutze Inlet (October-December). A smaller fishery occurs in Cornwall Inlet (July-December).

Commercial Clam Fishery: Clams are harvested in Khutze Inlet and Barnard Harbour.

Biophysical Capability for Salmonid Farming. The north half of Princess Royal Channel southward to, and including Khutze Inlet, and Swanson Bay are rated medium capability for finfish.

Recreational Salmon Fishery: There are sport salmon fishing areas in Graham Reach north of Sarah Island.

Tenures: The only Goal 1site with a marine component occurs in the Khutze watershed. Goal 2 sites are found in Barnard Harbour and Cornwall Estuary.

Archaeological Sites: This unit contains four archaeological sites

Tourism

Boating Use Areas: None identified

Marine Routes: The inside passage is found in this unit

Potential Marine Routes: None identified

Kayak Routes: Class 2 kayak routes are found in all channels

Potential Kayak Routes: None identified

Features: None identified

Facilities: Numerous anchorages in Khutze Inlet

C2- Laredo Channel and Inlet

Physical and Oceanographic Description

This planning unit extends from a sill at the confluence of Whale and Squally Channel on the northern boundary to the "Kitasu Peninsula" at Kipp Islets. The feature waterways are Laredo Inlet and Surf and Racey Inlets which are connected by Caamaño and Laredo Sounds. Caamaño Sound is an important crossroads for navigation routes and migration routes of marine mammals. Temperatures range from 13.0°C to less than 9.0°C. Except for Green Inlet, salinities are greater than 24.0 ppt but can remain below 30 ppt for many months of the year as a result of high precipitation. Because of strong tidal forces, freshwater inputs are often mixed deeply into the water column. Green Lagoon is brackish, humic and turbid during extreme run-off events. Thus, a well developed halocline is probably present in outer Green Inlet and, during warm summers, temperatures could rise to greater than 15.0°C. In Alexander Inlet the warming is likely to be more intense because there is little run-off. Tidal waters rush into the transition zone from the south, meeting Kitimat water to the north of the planning area near Butedale. Current velocities run about 100 cm/s in the main channels, are slower in the wider sections, but reach 200 cm/s in the narrowest reaches. Estuarine drive probably exists only out of Green Inlet because elsewhere the diluted surface water is mixed into the upper 50-75 m of the water column by tidal action. Winds probably do not add a significant component to the current regime because of very limited fetch considerations. Strong winds over the limited fetches also generate little in the way of waves. A full winter gale reportedly produces only 240 cm high waves from the southwest. Terrestrial slopes are steep throughout much of the transitional waterway areas. Avalanche chutes lead directly onto the channel surface throughout the region. The slopes of the deep channels below the water surface are also steep and, as a result, creek mouth delta fans built out onto them are potentially unstable. There are no published data on currents in Laredo Inlet, but mariners note a 150 cm/s current passing in and out of its mouth. The waters of Laredo Channel are cool throughout the year, likely due to the strong tidal currents which generate a well-mixed water column. Adjacent Laredo Sound however, is in the 13-15°C range. Laredo Inlet is likely an intermediate run-off fjord. Salinities are relatively high (30+ ppt) throughout the inlet. Oxygen levels in the Laredo system appear to be over-saturated throughout the spring-summer period, due to the presence of plankton blooms. The possible exception is Laredo Channel which mixes deep water to the surface, yielding slightly less than saturated levels. For the autumn period, oceanographic stations located on the southeast approach to Laredo Sound suggest that upwelling drops the saturation levels to the 80-90% range, and it can only be assumed that this condition exists throughout the system except possibly in estuarine environments. During both summer and winter wind sessions, steep 4.5 m waves are generated in Laredo Channel, running parallel to the prevailing wind directions. In outer Laredo Sound, 9 m high waves can be generated which reduce to about 6 m at the head. The swell also penetrates into Laredo Inlet. Freezing spray is an added exposure problem for vessels and floating structures. Within Laredo Inlet, there are frequent reports of a "vicious chop" and strong williwaws which "bounce" from wall to wall in the steep topography. Winter weather also brings on local freeze overs, heavy snowfall and avalanches which reach tidewater.

Biological Resource Values

Marine Fish: Important herring spawn and commercial herring roe fishery areas occur at the north end of Price Island, Higgins Passage and Kitasu Bay. There are important herring spawn areas at the east end of Caamano Sound and in Emily Carr Inlet (Ricker, 1995). Paralytic shellfish poison (PSP) testing invariably yields "hot" results at Meyers Passage and "mild" readings in Higgins Passage and Kitasu Bay. Sockeye salmon runs occur in many bays and inlets, with positive IHN tests on the Higgins Passage and Kitasu Bay runs.

Birds: High concentrations of Marbled Murrelets found in Green Inlet and moderate concentrations found in the Fraser – Graham Reach area.

Marine Mammals: In Princess Royal Channel transient Orcas, Risso's dolphins and Dall's porpoises have been reported. The area also supports wintering Fur seals, sea lions and several seal haulouts along Fraser Reach. Pacific White-Sided dolphins have been reported in all areas except the mainland inlets. Gray whale and harbour porpoise models indicate that they are found more frequently on the western side of Princess Royal Island, and often in the adjacent inlets.

Red and Blue Species: There are no threatened or endangered species in or adjacent to marine areas in this unit.

Herring Spawn: Herring spawning areas include Chapple Inlet, Racey Inlet, Helmken Inlet, and some areas of Surf Inlet.

Human Resource Use

Biophysical Capability for Salmonid Farming Approximately 72% of this planning unit is capable of supporting finfish farms. About 30% of the total area is rated medium and good capability. Embayments near Dallain Point are rated high, while Surf and Laredo Inlets are sited rated medium.

Commercial Sea Cucumber Fishery Myers Passage has an important commercial sea cucumber fishery. A smaller fishery occurs at the mouth of Laredo Inlet.

Sport Salmon, Groundfish, Crab, Clams and Shrimp Fishery Significant sportfishing occurs in a bay on the westcoast Swindle Island.

Herring Roe Fishery: There is a roe fishery in Laredo Sound (March) using both gillnet and seine methods.

Sea Urchin: The Estevan Group supports an important red urchin dive fishery from January-March. Similar fisheries of less importance occur at the mouths of all inlets south of Racey Inlet on Princess Royal Island. There is also a small fishery at the mouth of Laredo Inlet.

Tenures: Marine Goal 2 sites occur at Emily Carr Inlet, Racey Inlet, Smithers Sound, Laidlaw and Aitken Islands, Cann Inlet and Grant Anchorage. The only Goal 1 site occurs at Spirt Bear (Princess Royal Island).

Archaeological Sites: This unit contains 32 archaeological sites

Tourism

Boating Use Areas: None identified

Marine Routes: Meyers passage

Potential Marine Routes: None identified

Kayak Routes: Class 2 kayak routes are found in Laredo and Surf inlets

Potential Kayak Routes: None identified

Features: None identified

Facilities: None identified

C3 - Finlayson and Mathieson Channels

Physical and Oceanographic Description

This planning unit is comprised of Finlayson and Mathieson Channels and the connecting passes and tributary fjords to the south east of Princess Royal Island. Finlayson Channel is an important link in the Inside Passage which is relatively sheltered from severe storm winds. Mathieson Channel has two main exits to Milbanke Sound: (i) via Moss Passage to the west, and (ii) via Perceval Narrows to the south. Outer Mathieson Channel extends southwest of the latter, but oceanographically this reach is actually a "finger" of Milbanke Sound. The waterways of Mathieson and Finlayson Channels are characterised by a persistent 1-3 m thick dilute surface layer, which is a product of heavy rainfall. The run-off into the Mathieson Channel area is invariably humic stained water, especially in the outer reaches where bog covered terrain is prevalent. Glacier silt-induced turbidity is reduced in the absence of large glaciers, and the salinities at 3 to 5 m depth are usually above 24 ppt. In small inlets and bays with substantial inflowing creeks or rivers, the autumn salinities could decline to 15 ppt. The annual surface temperature range is typically 6.5°C to 14.0°C. The cycle of dissolved oxygen is uncertain for these waters.

Most of the waterways in this system are exceptionally deep and steep-walled. Terrestrial slopes are also steep, usually mantled by only a thin layer of "soil", which is prone to over-saturation. This can lead to the development of "skin" slides slipping over underlying smooth bedrock directly into the waterway. Recent slides of this type have occurred at Jackson Passage, Finlayson Channel, Sheep Passage, and Hiekish Narrows. A very large rockslide chute is also located at Carter Bay. Because fjord walls are steep, many creeks in this terrain will also have steeply sloped delta fans, and thus underwater stability is uncertain. During winter, many slopes, and especially steep gullies, are avalanche prone.

Winter storm exposure is moderate. Light freezing spray is reported in Finlayson Channel. Wind records collected at Boat Bluff show southeasterlies rarely reaching 56-69 kph; 31-42 kph is the more usual wind speed during storm events. Polar outflows appear to be the only identified problem for vessels and floating structures in Mathieson Channel. The waterways are therefore not usually rough. Williwaws are common however, at Meyers Passage.

There are frequent plankton blooms in this system. Pollution is not a problem for most of the Mathieson-Finlayson Channel subsystem because the dispersal medium is excellent and sources are few.

Biological Resource Values

Birds: Kynoch Inlet is the most important area for waterfowl. Large concentrations of surf scoters, unidentified goldeneye species, mallards, and Canada geese are found in this area. The entire area also supports high concentrations of bald eagles and marbled murrelets.

Marine Fish: Low to medium intensity herring spawn occurs along the southeast coast of Pooley Island.

Marine Mammals: The habitat capability is medium for Harbour porpoises and Humpback whales within this unit. The rating is high for Dall's porpoises.

Red and Blue Species: There are no threatened or endangered species in or adjacent to marine areas in this unit.

Fish Rivers: this unit contains 22 known fish bearing rivers

Salmon Bearing Rivers: There are thirty-four known salmon bearing rivers in this system, of these the Carter and Mussel Rivers and Kainet and Korich Creeks have very significant runs of mostly pink and chum with some sockeye and chinook salmon. Fifteen rivers have moderately significant runs of pink, chum and sockeye. These include the Lard, Big, Green Bay, Fallis, James Bay, Watson Bay, Gorilla, Canyon, Nameless, Bulley Bay, Hird Point, Salmon Bay, Duthie, Poison Cove, and Kitasu Creeks.

Human Resource Use

Biophysical Capability for Salmonid Farming: Approximately 78% of this planning unit is capable of supporting finfish farms. About 49% of the total area is rated medium and good capability. These areas include Mathieson Channel and surrounding passages, Sheep Passage and Tolmie Channel.

Commercial Sea Cucumber Fishery. Commercial sea cucumber harvesting occurs at Tolmie Channel, north Finlayson Channel, Mathieson Channel and Oscar Passage.

Commercial Salmon Net Fishery. In Finalyson Channel, Mathieson and Klemtu Passage there is a pink and chum fishery by gillnet and seine.

Tenures: Goal 2 sites with a marine component are found in Oliver Cove, Goat Cove, and Carter Bay.

Archaeological Sites: This unit contains 47 archaeological sites

Tourism

Boating Use Areas: None identified

Marine Routes: In all channels

Potential Marine Routes: None identified

Kayak Routes: None identified

Potential Kayak Routes: None identified

Features: Over thirty identified, several are on the shore

Facilities: Klemtu on Swindle Island

C4 - Offshore Laredo and Milbanke Sound

Physical and Oceanographic Description

The planning unit consists of two parts. The first is a section of deep, exposed offshore water in northern Queen Charlotte Sound which extends in a north-south alignment west of Price Island. The second consists of the deep offshore portions of southern Milbanke Sound and extends from northern Milbanke Sound to northern Queen Charlotte Sound. These areas will be subject to more exposure, and water quality will be less directly affected by nearshore runoff events. Extreme wave heights are reported for Milbanke Sound along with freezing spray.

Biological Resource Values

Birds: This area supports high concentrations of bald eagles and marbled murrelets.

Marine Fish: No data at this time.

Marine Mammals: Humpback whales, Dall's porpoises, and Pacific White-sided dolphins all have a medium habitat capability rating.

Red and Blue Species: There are no threatened or endangered species in or adjacent to marine areas in this unit.

Fish Rivers: This unit contains zero known fish bearing rivers.

Salmon Bearing Rivers: not applicable.

Human Resource Use

Biophysical Capability for Salmonid Farming: Approximately 20% of this planning unit is capable of supporting finfish farms, although the rating is for deep sea cages only.

Tenures: There is a single Goal 2 site at Grant Anchorage.

Archaeological Sites: This unit contains zero archaeological sites

Tourism

Boating Use Areas: None identified

Marine Routes: A single route was identified

Potential Marine Routes: None identified

Kayak Routes: None identified

Potential Kayak Routes: None identified

Features: None identified

Facilities: None identified

C5 - Inner Laredo and Milbanke Sound

Physical and Oceanographic Description

This planning unit extends from the southern tip of Princess Royal Island, surrounding Price Island and exposed outer coast islands, to the south tip of Hunter Island. In summer, outer Milbanke Sound is typically quite foggy and in winter, its exposure is characteristic of the coastal seaway. Geologically, Milbanke Sound is surrounded by granitic rock, but punctuated at a few sites by youthful to very young (post glacial) volcanic centres. Winter sea water temperatures range from 6°-7° C. Summer temperatures range from 13°-13.5°C. Oxygen declines usually begin in late summer with the arrival of oceanic upwelling deep water. Levels can drop to as low as 84% saturation in November and December. By February, oxygen levels rebound to near full saturation, and super-saturation often develops during the May-June bloom of diatoms. Currents in the outer Milbanke Sound area are dominated by tidal forces at narrow exits, and seasonally by winds and by estuarine discharge from the various channels which lead into the mountainous hinterland. At Higgins and Moss Passages, currents are reportedly in the 200-400 cm/s range; as are the rapids leading over a sandy shoal into Yaaklele Lagoon. In the large open water areas, the velocities are typically in the 10-50 cm/s range.

The climate of outer Milbanke Sound is severe. Winter storms produce freezing spray of moderate to light intensities and can generate waves in excess of 10 m in height that 'rub' the bottom at 80 m and probably greater depths. While the terrain is mainly flat, and hence slope stability is not a problem, the underwater environment consists of a broad variety of landforms. Outer Milbanke Sound itself varies from 100-250 m in depth, with several shallow banks on its eastern side and a maze of islets around McInnes Island on the west. Moss Passage is a deep channel with a shallow entrance sill. Higgins Passage gradually shallows up to a hazardous waterway at Kitasu Hills with several internal sills of less than 10 m depth to cross. The two tributary arms of this Passage are not charted. St. John Harbour and Yaaklele Lagoon are also silled at several points. The substrates in Milbanke Sound are decidedly granular to rocky. Muds for good anchorage occur only in the deeper waters, primarily below 200 m. The lesser waterways also tend to be granular to rocky with only the deep or flat areas being overlain by muds, which may be anoxic in the innermost silled-off basins. Pollution in the area is confined mainly to anchorages, notably St. John's Harbour, which has a pollution closure in Dyer Cove, and at Higgins Lagoon. Elsewhere, there is little human activity and dispersal potential tends to be very good. Much woody debris is reported to collect off the McInnes Island area, off Higgins Passage, and at Perceval Narrows which is located between Mathieson Channel and its connection to Milbanke Sound. On southwesters, debris also accumulates in the entrance area of Finlayson Channel.

Biological Resource Values

Birds: Spider Island supports populations of white winged surf scoters. 700-800 shorebirds are found on Chaney Pt. in the spring. Pigeon guillemots are found on Limit Rocks, Fingal Island, Guano Rocks, Gosling Rocks, Currie Islet, and Trikuet Rocks. Glaucous winged gull colonies are found at Price Rocks, Fingal Island, Guano Island, Fitz Melon Rock, Gosling Rocks, Currie Islet, and Trikuet Rocks. The area also supports high concentrations of bald eagles and marbled murrelets.

Marine Fish: Herring spawn and roe fishery activities both occur in Athlone Inlet, Kildidt Sound, south of Dowager Island and Lady Douglas Island, and south west of Dufferin Inlet. Herring spawn occurs at low intensity along the west coast of Price Island. Herring spawn is of "vital" concentrations in parts of Higgins Passage and at "important" levels in St. John Harbour and Louisa Cove. Sockeye salmon runs pass through outer Milbanke Sound and there are creek escarpments with positive IHN virus tests for those at Higgins Passage and Yaaklele Lagoon.

Marine Plants: According to MAFF (Field 1996) and CHS chart data, significant, high importance marine plants occur in the Goose and McMullen Groups and the exposed west coast of Price Island.

Marine Mammals: Sea otters have a high habitat capability rating in this unit, just north of the Goose Group (McMullen Island). Harbour porpoises, Pacific White-sided dolphins and Humpback whales have a medium habitat capability rating. The two significant sealion haulouts in this area are Gosling Rocks and McInnes Island.

Red and Blue Species: There are two unranked sites in this unit.

Fish Rivers: This unit contains two known fish bearing rivers.

Salmon Bearing Rivers: Tuno and Sound Point Lagoon Creeks have modest runs of pink, chum and sockeye salmon.

Human Resource Use

Commercial Sea Cucumber Fishery. Commercial sea cucumber harvesting occurs at Wurtele Island, Queens Sound, Spider Channel, and Seaforth Channel

Commercial Red and Green Sea Urchin Fishery. Significant harvesting of sea urchins occurs near Price Island and Kitsu Bay the west side of Athlan Island, Thompson Bay, Sidmond and generally along the south west side of Hunter Island

Sport Salmon, Groundfish, Crab, Clams and Shrimp Fishery. Significant sportfishing areas for salmon and groundfish include: Higgins Pass, Mathieson Channel off Lady Douglas Island, Catal Passage off Southern Price Island, Blair Inlet, Ivory Island, Seaforth Channel, Ivory Channel, Lama Channel, south-west Campbell Island, and Queens Sound.

Biophysical Capability for Salmonid Farming. Approximately 27% of this planning unit is capable of supporting finfish farms. The majority of the capable area is rated for deep sea cages, in Seaforth Channel. Only about 4% of the total area is rated either good or medium. The areas include the Admiral Prince Group, Blair Inlet, Powell Anchorage, and the Athlone-Bardswell Group.

Tenures Marine Goal 2 sites occur at McMullin Group, Oliver Cove, Grant Anchorage, and Cann Inlet.

Archaeological Sites: This unit contains 55 archaeological sites

Tourism

Boating Use Areas: Covers almost the entire southern portion.

Marine Routes: Several in planning unit.

Potential Marine Routes: None identified

Kayak Routes: None identified

Potential Kayak Routes: None identified

Features: Over thirty identified, many in Higgins Pass and Kitasu Bay

Facilities: Klemtu and a fishing lodge

C6 - Inner Hunter - Cunningham Islands

Physical and Oceanographic Description

Seaforth Channel is bounded by the Bella Bella archipelago to the south and east, and the Spiller-Return Channel area to the northeast. Freeze-over occurs for significant periods each winter at Briggs Inlet, Roscoe Inlet, and Spiller Inlet. Williwaws are common in inner Spiller Channel and North Bentinck Arm. Seaforth Channel experiences exceptionally strong diurnal breezes with choppy waves impassable for small craft particularly in the afternoon. At the 2-6 m depth, there is a reasonably long summer season with temperatures in the 12-16°C range. Warmer temperatures are found in the shallow waterways such as Gale Passage and Yaaklele Lagoon. Winter temperatures appear to be in the 6-7°C range, increasing slightly at greater depths. Troup Passage might also overheat during a hot dry summer because its northeast entrance sill is very shallow, thereby limiting surface water exchange. The circulation throughout the archipelago is complex, due to the seasonal or shorter-term shifts of estuarine flow as brought about by ever changing wind patterns. Most channels have a strong tidal current component in excess of 50 cm/s. Overall throughout the region, dissolved oxygen levels are expected to fluctuate throughout the year in concert with the ocean's upwelling cycle, dropping below full saturation levels in late summer-early autumn, and returning to full saturation during spring diatom blooms, which are very conspicuous in Queens Sound.

Substrates throughout the region are generally rocky to gravely, with broken shells in much of the pass areas. Currents and swell, plus a resistant local lithology (granitic rocks) and lack of large sediment bearing local river systems, are all factors which help create this type of substrate. Thick fogs in late summer months often blanket the area, with only a slight decrease in their persistence to the northeast. Water traffic is at its busiest while the presence of fog is at its worst. Winter weather produces a combination of wave and swell that easily exceeds 10 m in Queen Charlotte Sound, which is only slightly attenuated in Queens Sound. These storm waves "rub" the bottom and often shift the substrate. Freezing sprays are only reported at the mouth of Seaforth Channel. However, the exposure factor in the Bella Bella archipelago is not to be underestimated. Southwesters during the winter are unrelenting and sweep through all but the most ideally-sheltered waterways, but parts of Queens Sound will provide some protection. Snow fall does occur but the 24-hour falls are usually less than 60 cm; freeze-overs are rare for all but the more secluded waterways. Kliktsoatli Harbour has had solid freeze-overs and overnight snowfalls as great as 120 cm, and light skiffs of ice are also not uncommon. At Waglisa and McLoughlin Bay, such conditions are not as severe, but polar outflow winds definitely buffet the area.

Significant salinity dilutions reach the edge of the coastal seaway in all months except winter and early spring. Freshwater intrusions can occur in almost all months. Lowest monthly mean salinities at 1 m are typically 24-25 ppt, and the highest are near 30 ppt. Daily fluctuations can be as much as 9.1 ppt. Haloclines may reach 5 m depths and the overlying dilute layer could easily drop below 15 ppt. In Spiller Channel, the July water temperatures at 4 m were warm in the inner channel area and hot within the inlet (19.0° - 20.5°C). Winter temperature data are sparse. In Milbanke Sound a reading of 6.9°C at 3 m depth indicates that temperatures at 5-10 m depths will be slightly above 7.0°C. However, in Spiller and Briggs Inlets, and at Ellerslie Lake (4°C measured), long freeze-over periods have been noted. Spiller Channel is also a corridor for polar outflow winds.

There are no published records of currents or circulation for the Seaforth Channel system. The lack of charting has discouraged such investigations. The few salinity records show a nine-month estuarine flow season, and for the balance of the year (winter) there would certainly be a wind-driven current component and perhaps a return circulation of shelf water which could move at 5 cm/s. Most outlet channels from silled basins experience a tidal jet discharge. Waterways where currents are likely to be slack are Briggs, Berry, and Lombard Inlets, and possibly Yeo Cove. Replacement of bottom waters in inlets by intrusion of oceanic upwelled water over the entrance sill has not been demonstrated with the limited data available.

The wind and wave regime of the region varies from "unbearable" in outer Seaforth Channel, to "barely noticeable" in some of the small waterways. Afternoon breezes in Seaforth Channel generate a severe steep chop which usually halts small vessel traffic. Winter storms in Milbanke Sound generate a sea with wave troughs that reportedly "hide all but the largest vessels". Freezing spray is often encountered in Milbanke Sound but usually not elsewhere. Slopes along some inlets are decidedly unstable. Spiller Inlet has the greatest record of slides, followed by Briggs Inlet.

Biological Resource Values

Birds: Concentrations of unidentified goldeneye species and mallards are found in Spiller Inlet, while unidentified goldeneye species are found in Nechas Inlet and Johnson Channel/Rosco Inlets. Quartcha Bay supports populations of mallards, unidentified goldeneye species, California gulls, and diving ducks. The area also supports high concentrations of bald eagles.

Marine Fish: Considerable low intensity herring spawn occurs in Kildidt Sound. Roe fishery and spawn activity takes place at the junction between Seaforth Channel and Raymond Passage. As well, sporadic spawn activity occurs on the west side of all islands in the unit. Fish health problems are largely unknown in the region. Sockeye salmon runs pass through outer Milbanke Sound and there are creek escarpments with positive IHN virus tests for those at Higgins Passage and Yaaklele Lagoon. The hatchery at McLoughlin Bay has recorded the usual problems, but the sockeye have not revealed any IHN virus. There are several sockeye-bearing streams and waterways in the region. Chronic PSP is, however, reported in the Bella Bella Archipelago.

Marine Plants: There are some significant kelp beds in Kinsman Inlet, Hunter Island

Marine Mammals: Humpback whales have a medium habitat capability rating in this planning unit.

Red and Blue Species: There are no threatened or endangered species in or adjacent marine areas in this unit.

Fish Rivers: This unit contains 27 known fish bearing rivers

Salmon Bearing Rivers: There are thirty-seven known salmon bearing rivers in this system, of these Neekas, Roscoe and Clatse Creeks have very significant pink and chum runs with some sockeye runs. Fourteen rivers including the Pine, Tankeeah, Kwakusdis, and Kunsoot Rivers and Deer Pass, Bullock Channel, Kakushdish, Mclaughlin Bay, Howyete, Scribner, Ellerslie Lagoon, Quartcha, Lee and Cheenis Lake Creeks all have moderately significant runs of mainly pink and chum salmon.

Human Resource Use

Biophysical Capability for Salmonid Farming Approximately 25% of this planning unit is capable of supporting finfish farms. The majority of planning unit 6 is rated as medium capability. However, Hunter Channel, Peter Bay, Joassa-Louise Channel, Troop Passage, and Boddy Narrows all have a high capability rating..

Biophysical Capability for Shellfish Farming. A good oyster capability rating for this unit appears in approximately 6% of the total area, scattered throughout the Hakai Group. Roughly 6% of the total unit area has medium or good scallop capability, occurring in sheltered areas.

Commercial Sea Cucumber Fishery. Commercial sea cucumber harvest occurs in Spider, Seaforth and Return Channels, Lama, Gunboat and Raymond Passages, Roscoe Inlet and around the McNaughton Group. Significant commercial sea urchin harvesting occurs throughout this unit but concentrated south of Seaforth Channel.

Sport Salmon, Groundfish, Crab, Clams and Shrimp Fishery: This planning unit is one of the most significant areas for sportfishing. Significant crab sportfishing occurs at Hansen Point, Roscoe Inlet, and Neekas Point on Donn Peninsula, northeastern tip of Roscoe Inlet, Clatse Bay in Roscoe Inlet, Troupe Passage near Chatfield Island and East and South East Hunter Island in Hakai Recreation Area. There is significant salmon sportfishing activity at Clatse Point, Roscoe Inlet, Return Channel, Seaforth Channel at Lama Channel, Seaforth Channel off Campbell Island, Gunboat Pass, Denny Island, Southwest Campbell Islands, Queens Sound at Fisher Channel. Queens Sound at Hakai, Nalau Island at Hakai Recreation Area and Fisher Channel. Significant recreational harvesting of clams occurs at Gunboat Pass and Denny Island.

Tenures: The only Goal 1 site occurs at Ellerslie Lake Harbour. The only Goal 2 site is found at Troup Passage.

Archaeological Sites: This unit contains 149 archaeological sites

Tourism

Boating Use Areas: Some identified

Marine Routes: In most areas

Potential Marine Routes: Two identified

Kayak Routes: None identified

Potential Kayak Routes: None identified

Features: Anchorages in Fjordland Recreation Area

Facilities: 11 near Bella Bella

C7 - Dean and Burke Channels

Physical and Oceanographic Description

Burke and Dean Channels experience very rough seas because of outflow winds exceeding 100 kph. Burke Channel is described by professional oceanographers as "one of the wildest and most unpredictable waterways" on the entire coast of British Columbia. Its diurnal breezes are exceptionally strong with impassable choppy waves for small craft. Much of the corridor is perfectly aligned for polar outflows. Such winds excessively cool the inlet waters in winter. The Burke Channel estuary is not only encumbered with low salinities from the head to Hakai Pass, but it is also known for the development of internal waves found in zones of turbulent mixing. These include the junction with Labouchere Channel, off the Kwatna Inlet entrance, over much of the Hvidsten Point sill near its mouth, and throughout much of upper Fitz Hugh Sound, except possibly in the Namu Harbour area, where surface waters are in a back eddy or leeward aspect. Strong up and down-inlet diurnal winds can completely shut down small boat traffic on Burke Channel each afternoon. Williwaws are common in Kwatnal Inlet. Kimsquit Bay at the head of Dean Channel, and South Bentinck Arm experience significant periods of freeze-over for several months each winter. During winter winds, wave heights reach 3m and can be accompanied by freezing rain at any point between Bella Coola Harbour and Fitz Hugh Sound.

Dean Corridor experiences significant turbidity plumes extending down-channel to Labouchere Channel where the surface outflow divides. Exposure is a major concern throughout the corridor. Polar outflows, as well as southwesters in Fisher Channel generate freezing sprays. Waves reportedly reach 3 metre heights from either direction on Fisher Channel during winter. Summer breezes are also strong: both diurnal (up and down-inlet) system winds and northwesters generated by the North Pacific high pressure cell are present. Shelter from these forces can be obtained in tributary inlets along each reach of the corridor. However, these tributaries are prone to heavy snowfall (and avalanches), and some may freeze over. Cascade Inlet, the southern counterpart of Gardner Canal to the north, has frequent avalanches. Avalanches also occur at many points along Dean Channel, particularly towards the head. Slopes are also mobilised by rainfall into either direct landslides or indirect debris flows/torrents into creeks, rivers or seasonally wet ravines. Cousins Inlet has a track record for such calamities, and there are reports of slope instability in most other waterways. Steep slopes and very heavy precipitation ensure that slopes will always be active. The underwater deltas of the Kimsquit and Dean River and several delta fans entering the Dean are also of suspect stability. There is the potential for underwater turbidity current events generated by slide movement. Jellyfish are "scattered" to "abundant" throughout the corridor. Port John and Kisameet Bay have important estuaries, historic anchorages and sockeye salmon runs at the significant level. Elsewhere in this corridor, most tributary inlets are steep walled "pipes" which funnel in harsh environmental conditions.

Biological Resource Values

Birds: The most important waterbird areas are found in Showquitz estuary (swans, mallards, unidentified widgeon species, bufflehead ducks, Canada geese, surf scoters), Elco Creek estuary (mallards, unidentified goldeneye species, unidentified grebes), South Bentnic Arm (unidentified goldeneye species, surf scoters, Canada geese, unidentified merganser species, bufflehead ducks, mallards, unidentified grebe species), Taleomey/Norick River estuary (unidentified goldeneye species, surf scoters, Canada geese, unidentified merganser species, bufflehead ducks, mallards, unidentified grebe species, unidentified scaup species, swans), Quatlena River estuary (mallards, unidentified widgeon species, unidentified goldeneye species), and Bella Coola River estuary (mallards, unidentified goldeneye species, unidentified widgeon species, common merganser, dabbling ducks, diving ducks).

Areas of moderate importance for waterbirds include Ocean Falls/Stokes Island (unidentified goldeneye species), Kimsquit River estuary (mallards, common merganser, unidentified goldeneye species, swans), Dean River estuary (mallards, dabbling ducks, diving ducks), the northern coast of Dean Channel (unidentified merganser species, unidentified scoter species, unidentified goldeneye species), Jenny Inlet (unidentified goldeneye species, mallards, Canada geese, unidentified merganser species, bufflehead ducks), Evans Inlet (unidentified goldeneye species, Canada geese), and Kwatna estuary (Canada geese, unidentified goldeneye species, mallards, swans, bufflehead ducks, unidentified merganser species).

Marine Fish: Significant herring spawn occurs along the south side of King Island. A significant sockeye run also enters the Bella Coola River carrying the IHN virus amongst many other reported medical problems. Sockeye runs of major importance occur at Kisameet Bay, Port John, Dean River and the Kimsquit River (150,000 escapement). They have yet to be tested for the IHN virus. Herring spawn is heavy on both sides of the main corridor of Burke Channel from Restoration Bay right through to the Bella Coola harbour area and it is found in spotty concentrations at Namu, Kwatna Inlet and various stretches of South Bentinck Arm. In contrast to the rest of

the BC coast, the herring spawning occurs in mid to late spring, rather than in River estuary, and the estuary is "home" to the largest pink salmon run in the province. Biologically the Dean Channel area is not quite as active as Burke Channel. Herring spawn is only concentrated at the head and "minor" or "spotty" at Cousins Inlet (harbour), Luke Island, De Cosmos Lagoon and possibly outer Roscoe Inlet (Ricker, 1995).

Marine Mammals: Humpback whales and Dall's porpoises have a medium habitat capability rating in this planning unit.

Red and Blue Species: There are three blue listed sites in this unit.

Fish Rivers: This unit contains 30 known fish bearing rivers

Salmon Bearing Rivers: There are thirty-two known salmon bearing rivers in this system. The Frenchmen and Elcho Creeks, and the Kwatna, Necleetsconnay, Asseek, and Nooseseck Rivers all have very significant mainly pink and chum salmon runs. The Dean, Kimsquit, and the Bella Coola Rivers have pinks and chums and also very significant sockeye and chinook runs.. Thirteen rivers have moderately significant runs of pink and chum with some having sockeye as well. These rivers include the Cascade, Martin, Taleomey, Quatlena, Nootum, Kisameet, Skowquiltz Rivers and Nieumiamus, Jenny Bay, Hook Nose, Sagar, Eucott Bay and Kimsquit Bay Creeks.

Human Resource Use

Biophysical Capability for Salmonid Farming Approximately 18% of this planning unit is capable of supporting finfish farms. The majority of the capable areas have a 'limited' (9.5%) or 'deep sea cages' (7.5%) rating. Only about 1% of the total area is rated medium: Mathew Passage, outer Cousins Inlet and Kisameet Bay.

late winter. There are also eulachon runs which enter into the Bella Coola

Biophysical Capability for Shellfish Farming A good oyster capability rating for this unit appears in 0.2% of the area, in Elcho Harbour. Of the total unit area, 0.7% has a good scallop capability, in Sagar Lagoon.

Commercial Salmon Net Fishery In Burke Channel there is a commercial fishery for pink, chum, sockeye and Atnarko chinook. In Fisher Channel, in upper Fitz Hugh Sound there is a commercial fishery for pink, chum.

Tenures Goal 2 sites occur at Codville Lagoon, Port John, Restoration Bay, Quatlena Estuary, Kwatna Estuary, Eucott Bay, Asseek Estuary, Ickna Estuary, Taleomey/Noeick Estuary, Bella Coola Estuary, Skowquiltz Estuary, and Kimsquit Estuary.

Archaeological Sites: This unit contains 76 archaeological sites

Tourism

Boating Use Areas: None identified

Marine Routes: In all Inlets except Cascade Inlet

Potential Marine Routes: One

Kayak Routes: Several identified

Potential Kayak Routes: None identified

Features: Evenly distributed throughout the unit, include guest ranches, anchorages, camping etc.

Facilities: Three clusters centring on Ocean Falls, Kimsquit, and Bella Coola

C8 - Fitz Hugh Sound

Physical and Oceanographic Description

This unit extends from the southern tip of King Island to the southern tip of Calvert Island and encompasses Hecate and Nalau Islands. In Fitz Hugh Sound winds dominate the behaviour of the water mass and in turn the channel's suitability for navigation. During strong southeasters, marine traffic uses the narrow but deep shelter near the shoreline to "lay over" until the storm blows through. Surface estuarine outflow also backs up and is forced out through the incoming swell at Hakai Pass. Water temperatures are normally cold at the 5 m depth with a thermocline developing at about the 3 m depth. Above the thermocline, temperatures are usually in the 10-13°C range, although one August measurement reached 16.1°C. Temperature-salinity fluctuations are to be expected because not only are they induced by wind and tide changes, but also by internal waves which are generated by some form of subtle current interference pattern off the Hakai Pass entrance where there is cross-channel flow. Surface waves can reach 600 cm height on the swell during southwesterly storms. Darby Channel offers shelter from the vigorous climatic and oceanographic regime of Rivers Inlet. Darby is a tidal-swept channel, with a well-mixed water column. Turbid dilute waters only penetrate into the channel slightly on rare occasions. The channel experiences hectic seasonal boat traffic.

Fish Egg Inlet has extensive humic brown-stained water due to run-off from the surrounding low-lying terrain which is of acid bog soils overlying granitic rocks. The run-off to the inlet at the head develops a surface brown dilute layer. The main outer inlet, though quite saline, is also brown coloured. Dissolved oxygen levels are undoubtedly lower than normal, although the humic condition probably reduces the toxicity of any dissolved metals in the water, acting as a chelator. Water temperatures in the Fish Egg Inlet increase towards the head because of the very low run-off in late summers. Native oysters are reportedly at the northernmost limit of their range in Oyster Bay; thus water temperatures likely reach 20°C in this waterway. Elizabeth Lagoon and Sulphur Arm are likely as warm, with apparent dissolved oxygen deficiencies brought about by shallow sills and lack of estuarine drive. Autumn dilution is adequate, however, to bring on a freeze-over in most tributary inlets. No major salmon spawning estuaries are found in the Fish Egg Inlet area and there are no reports of visible phytoplankton blooms. Kwakume Inlet is a very popular anchorage for recreation and commercial boaters; it has a dense *Cyanea* jellyfish population and records of a "rusty bloom"; and, it is shallow (33 m depth maximum), with a high (6.2 m deep) entrance sill.

Biological Resource Values

Birds: The most important area for waterbirds is the Koeye River estuary, which supports populations of swans, unidentified widgeon species, bufflehead ducks, unidentified goldeneye species, and mallards. Harlequin ducks and unidentified grebe species are found in Fairmile Passage. The area also supports high concentrations of bald eagles.

Marine Fish: Significant herring spawn occurs on the mainland coast within this unit, as well as some in Kwakshua Channel. There are two small herring roe fisheries in Illabie Inlet and in the small Bay to its north. Darby Channel is a large sockeye salmon run, which also carries the IHN virus. Adult sockeye salmon with the IHN virus return to spawn in the Koeye River.

Marine Mammals: Humpback whales have a high habitat capability rating in this unit. Addenbroke Point is the site of a significant sealion haulout.

Red and Blue Species: There are no threatened or endangered species in or adjacent marine areas in this unit.

Channel, the west coast of Hecate Island and the waterways northwest of Nalau Island.

Fish Rivers: This unit contains five known fish bearing rivers.

Salmon Bearing Rivers: There are six known salmon bearing rivers in this system. Of these the Koeye River has very significant runs of pink and sockeye and Namui and Cold Creek have moderately significant runs of sockeye and pink respectively.

Human Resource Use

Biophysical Capability for Salmonid Farming. Approximately 66% of this planning unit is capable of supporting finfish farms. The majority (56%) of the capable area is rated for deep sea cages. Only about 6% of the total area is medium: Fish Egg Inlet and Darby entrance

Biophysical Capability for Shellfish Farming. A good or medium oyster capability rating for this unit appears in approximately 9% of the total area, in Fish Egg Inlet, Pierce Bay, Darby Channel, and the west coast of Hecate Island. The waterways northwest of Nalau Island have a medium oyster capability rating. Nearly 7% of the total unit area has medium or good scallop capability, occurring in Fish Egg Inlet, Pierce Bay, Darby

Commercial Red and Green Sea Urchin Fishery. Significant commercial sea urchin harvesting occurs in Kwakshua Channel and along the shoreline north of Illabie Inlet, Safety Cove and Pierce Bay

Commercial Salmon Net Fishery. In Fisher Channel, in lower Fitz Hugh Sound, there is a commercial fishery for pink and chum salmon.

Tenures: There is a single Goal 1 site in the Koeye area.

Archaeological Sites: This unit contains 47 archaeological sites.

Tourism

Boating Use Areas: Mainly in the northern portion of the study area

Marine Routes: In most areas

Potential Marine Routes: Begins at Pierce Bay, and heads into C-9

Kayak Routes: None identified

Potential Kayak Routes: One identified in the south-eastern portion of the unit

Features: Clustered around north Calvert Island and in Fish Egg Inlet

Facilities: Clustered near north Calvert Island, and single facilities in the Bay just south of Burke Channel and near the eastern side of Calvert Island

C9 - Rivers Inlet

Physical and Oceanographic Description

This unit encompasses Penrose, Ripon and Walbran Islands, and includes all of the inlets in this system: Rivers, Hardy, Draney, and Moses. Rivers Inlet develops a deep and intense halocline over the entire summer and autumn period. Water temperatures at 5m depth remain cold throughout the waterway in all seasons. There are no reported freezeovers in Rivers Inlet but "super chill" during polar outflows does occur. Robert Arm and Hardy Inlet both experience freeze-over for significant periods each winter. Draney Inlet, an intermediate run-off fjord, is a tidal range restricted inlet. Only a few sockeye salmon enter Draney inlet to spawn. Marine traffic in this inlet is concentrated at its entrance. Marine mammal traffic is low in Draney Inlet. Rivers Inlet and Darby Channel are corridors for the third largest sockeye salmon run in BC, which also carries the IHN virus. Dense plankton blooms are another problem for finfish. In Rivers Inlet turbidity plumes are quite extensive out to the entrance to Moses Inlet. Moses and Hardy Inlets freeze over and have unstable terrestrial slopes. High tsunamis (9.3m) could reach the head of Moses Inlet. The head of Rivers Inlet is the scene of much milling wildlife, schooling sockeye salmon, dense herring spawn activity and dilute turbid waters. There have been pollution problems at both inlets, with logging camps located on the Kilbella and Wannock River deltaic estuaries. There are a number of other potential pollution sources at the head of Rivers Inlet such as the marina on the Wannock River, several other sport camps, SEP facilities, and a flotsam of debris which collects off the mouth of Moses Inlet. During winter polar outflow winds, the surface of the inlet is often seen as a wreathing swirl of wind-tossed whitecaps and freezing spray, which push the debris on 3 m wave crests down-inlet into the Fitz Hugh Sound entrance region.

Biological Resource Values

Birds: Important waterbird areas are found in Darby Channel (surf scoters, harlequin ducks), and Moses Inlet (western grebes, swans, bufflehead ducks, unidentified merganser species, unidentified goldeneye species, Canada geese). Waterbird areas of moderate importance include Hardy Inlet (mallards, unidentified goldeneye species), Kilbella River estuary (mallards, bufflehead ducks, unidentified merganser species, Canada geese, and swans), Wannock River estuary (unidentified merganser species, unidentified goldeneye species, unidentified widgeon species, mallards, bufflehead ducks), and Draney Creek estuary (swans).

Marine Fish: Significant herring spawn occurs at the head of Rivers Inlet. The very head of the inlet is a high intensity spawning area. The rest of the head of Rivers Inlet is of medium intensity.

Marine Mammals: Harbour porpoises, Humpback whales and Dall's porpoises have a medium habitat capability rating in this unit. The significant sealion haulout in this area is at the head of Rivers Inlet. There are 2 seal haulouts in the area: also at the head of Rivers Inlet, and at the entrance to Draney Inlet.

Red and Blue Species: There are no threatened or endangered species in or adjacent marine areas in this unit.

Fish Rivers: This unit contains 10 known fish bearing rivers

Salmon Bearing Rivers: There are fourteen known salmon bearing rivers in this system. The Wannock, Clyak, Kilbella Rivers and Johnston Creek have very significant runs of salmon. Of these river the Wannock has very significant runs of sockeye, chinook and chum, and moderately significant runs of pink and chum.. Milton, Tseeiskay and Nicknaqueet Rivers, Macnair, Lockhart, Gordon, Draney and Allard Creeks all have moderately significant runs of mainly pink and chum salmon.

Human Resource Use

Biophysical Capability for Salmonid Farming. Approximately 54% of this planning unit is capable of supporting finfish farms. About 13% of the total area is rated medium and good capability. The areas rated good include Klaquaek Channel and the area east of Penrose Islets. The areas rated medium include Darby entrance, Darby Channel, outer Draney Inlet and "Cannery Alley".

Biophysical Capability for Shellfish Farming. A good or medium oyster capability rating for this unit appears in approximately 11% of the total area. "Cannery Alley", East Penrose Islets, Pierce Bay, and the head of Draney Inlet have a good oyster capability rating. Outer Draney Inlet and southern Darby Channel have a medium rating. Roughly 12% of the total unit area has medium or good scallop capability. This area consists of "Cannery Alley", East Penrose Islets, Pierce Bay, the head of Draney Inlet, outer Draney Inlet and southern Darby Channel.

Commercial Salmon Net Fishery. From the mouth of Rivers Inlet to Sandell Bay including Draney Inlet there is a sockeye fishery by gillnet. In Rivers Inlet there is a pink and chum fishery by both gillnets and seine.

Tenures: There are Goal 2 sites at Kilbella Estuary and Clyak Estuary.

Archaeological Sites: This unit contains 29 archaeological sites

Tourism

Boating Use Areas: None identified

Marine Routes: In most inlets

Potential Marine Routes: Two, one of which runs from the lake into the inlet

Kayak Routes: None identified

Potential Kayak Routes: None identified

Features: Clustered near Penrose, Walbran and Ripon Island (@10), and Kilbella Estuary. 35 sites in total.

Facilities: Ten, of which 4 are in Rivers Inlet

C10 - North Passage

Physical and Oceanographic Description

This planning unit represents the offshore portion of Queen Charlotte Sound extending from Haikai to Cape Caution. This area is comprised of high exposure and moderate depth nearshore and offshore area that does not include islands.

Biological Resource Values

Birds: Areas of moderate importance for waterbird species include Cape Calvert (brant geese, Pacific loons), Open Bight (unidentified scoter species), and Egg Rocks (surf scoters). Black oystercatchers are found on Egg Rocks and Armstrong Rocks. Pigeon guillemots are found on Blenheim Islands, North Pointers Island, Upward Rock, Major Brown Rock, Ruby Rocks, Egg Island, and Dugout Rocks. Rhinoceros and Cassin's auklets are found on Egg Island. Glaucous winged gull colonies are found at Blenheim Islands, Airacobra Rock, North Pointers, Upward Rock, Major Brown Rock, Ruby Rocks, Egg Island, and Dugout Rocks.

Marine Fish: The significant herring spawn area in this unit, in Goose Bay, has a high to medium capability rating.

Marine Plants: There are important kelp beds in the Hakai Pass area

Marine Mammals: Pacific White-sided dolphins and Humpback whales have a medium habitat capability rating in this unit. Dall's porpoises have a high habitat capability rating. This area has three significant sealion haulouts: Blenheim Island, Major Brown Rock, and Kelp Head.

Red and Blue Species: There is a single red listed site and two unranked sites.

Fish Rivers: this unit contains zero known fish bearing rivers

Salmon Bearing Rivers: There are four known salmon bearing rivers in this system all of which are small runs. These rivers include Hogan, (pink and chum) Chic Chic (sockeye), Dsulish and Hagen Creeks.

Human Resource Use

Biophysical Capability for Salmonid Farming. Approximately 52% of this planning unit is capable of supporting finfish farms. The majority (50%) of the capable area is rated for deep sea cages. Only about 2% of the total area is rated good or medium: Home Bay, Middle Smith Inlet, Southern Klaquaek Channel.

Biophysical Capability for Shellfish Farming. A good oyster capability rating for this unit appears in 0.3% of the area, in Goose Bay. The same 0.3% of the total unit area also has a good scallop capability.

Commercial Red and Green Sea Urchin Fishery. Significant commercial sea urchin harvesting occurs along Calvert Island coastline near Hakai Pass and in Chic Chic Bay and surrounding Open Bight and along all shorelines at the entrance of Smith Sound.

Sport Salmon, Groundfish, Crab, Clams and Shrimp Fishery. There is significant sportfishing for salmon in Kwakshua Channel in Hakai Recreation Area, and in Hakai Pass, Addenbrooke Point to Fury Island, east of Penrose Island, south and west of Penrose Island, Cape Calvert, south of Walbran Island, and Bay Point in Smith Sound and Cape Caution north to Smith Sound. There is also significant crab sportfishing in northwest Calvert Island in Hakai Recreation Area and Goose Bay in Rivers Inlet.

Tenures Goal 2 sites occur at Cranstown Point, Cape Caution, and the Duke of Edinburgh Extension.

Archaeological Sites: This unit contains 21 archaeological sites

Tourism

Boating Use Areas: Fringing along northern boundary

Marine Routes: Along eastern side of planning unit, stops on Calvert Island

Potential Marine Routes: None identified

Kayak Routes: None identified

Potential Kayak Routes: None identified

Features: Approximately 50 sites found along Open Bight – Goose Bay to Smith Sound

Facilities: Two clusters near north Calvert Island and Goose Bay

C11 - Smith Sound

Physical and Oceanographic Description

This planning unit extends from Cathcart and Indian Islands and includes Smith Inlet, Boswell Inlet, Naysash Inlet, Ahclakerho Channel and Wyclees Lagoon. Smith Inlet is an intermediate run-off fjord. Outer Smith Sound water temperatures range from 7°C to 13°C. These temperature conditions are found in very few other areas in the entire British Columbia coast. In the winter the heads of all of the inlets in this system freeze over. Salinities in Smith Sound are relatively stable. Smith Inlet is the milling and nursing area for the fourth largest sockeye salmon run in BC. This large indigenous sockeye run bears the IHN virus. The Smith Sound system experiences good mixing of the water column. Waves, fierce winds and exposure are problems for vessels and floating structures in Smith Sound. Takush Harbour is completely surrounded by vital herring spawn, extending into many areas of inner and middle Smith Sound. Smith Inlet and its tributaries are observed to be slide prone, enhanced by logging activity.

Biological Resource Values

Birds: Areas of moderate importance for waterbird species include Smith Inlet (unidentified goldeneye species, surf scoters, unidentified merganser species), and Takush estuary (swans, mallards, Canada geese, unidentified widgeon species).

Marine Fish: Anchor Bight is the site of a herring roe fishery. Herring spawn activity occurs on the west side of Greaves Island and at the head of Smith Inlet.

Marine Mammals: Harbour porpoises and Humpback whales have a medium habitat capability rating for this planning unit. Wyclees Lagoon supports a significant seal haulout.

Red and Blue Species: There are no threatened or endangered species in or adjacent to marine areas in this unit.

Fish Rivers: this unit contains four known fish bearing rivers

Salmon Bearing Rivers: There are seven known salmon bearing rivers in this system. The Nekite, River and spawning channel at the head of Smith Inlet have very significant runs of pink and chum with some chinook and sockeye. The Docee River has a very significant run of sockeye and chinook. The Takush River has a moderately significant run of chum.

Human Resource Use

Biophysical Capability for Salmonid Farming. Approximately 72% of this planning unit is capable of supporting finfish farms. About 60% of the total area is rated medium and good capability. The areas of good capability include Inner Smith Sound, Outer Boswell Inlet and Ahclakerho Channel. The majority of the medium rated area is in Smith Inlet.

Biophysical Capability for Shellfish Farming. A good or medium oyster capability rating for this unit appears in approximately 17% of the total area. Naysash Inlet is rated medium oyster capability. Broad Reach, Ahclakerho Channel and smaller scattered areas have a good capability rating. Roughly 13% of the total unit area has medium or good scallop capability, in Naysash Inlet, Broad Reach and Ahclakerho Channel.

Commercial Salmon Net Fishery. In Boswell and Smith Inlet and in Wyclees Lagoon there is a gillnet fishery for Long Lake sockeye.

Tenures Goal 2 sites occur at Takush Harbour and Nekite Estuary.

Archaeological Sites: This unit contains 19 archaeological sites

Tourism

Boating Use Areas: None identified

Marine Routes: Two routes, one of which runs up Smith Inlet

Potential Marine Routes: None identified

Kayak Routes: None identified

Potential Kayak Routes: None identified

Features: Approximately 20 throughout the unit

Facilities: Two site in Margaret Bay and Nalos Landing

C12 - Seymour Inlet

Physical and Oceanographic Description

This planning unit includes all of the waterways in the Seymour-Belize Inlet system, from the south of Slingsby Channel. Seymour Inlet is primarily an intermediate run-off fjord. It has a very narrow, shallow sill entrance such that during tide changes, the Inlet neither fills nor empties to the same level as the outside seaway. Tidal range for Seymour Inlet is reduced because the outlet is too constrained to allow exchange of the full tidal prism. This is reflected in low salinity compared with other inlets, and a slow decline in dissolved oxygen below surface waters. There is considerable logging activity in Seymour inlet. Associated accumulated decomposing bark in the waterway adds to the already strained biochemical oxygen demand, with water renewal only in winter and not reaching all basins. Outer Seymour inlet is a fast moving tidal-swept channel. Much of the waterway is not useable for aquaculture because of excess velocity accompanied by voluminous logging and winter flood debris. It is oriented in perfect alignment with the winter south-easter and summer northwester. Middle and Upper Seymour Inlet are prone to strong diurnal breezes with impassable choppy waves for small craft. Outflowing Schooner and Slingsby Channels are similarly swift, with few quiet areas large enough to provide for a large farm site. In Nugent Sound oceanic water does not reach its head. The only process of oxygen renewal on a year-round basis is tidal jet circulation over its several sills. Although there is pronounced run-off in Alison Sound, it appears to be "gliding over" the stagnant waters lying below sill depth. Freeze-over for significant periods each winter occurs in Mereworth Sound and Alison Sound.

Biological Resource Values

Birds: No data at this time.

Marine Fish: Significant herring spawn occurs in Upper Nugent Sound and Wigwam Bay.

Marine Mammals: Banford Lagoon and Mereworth Entrance support significant seal haulouts. Treadwell Bay is a significant sealion haulout

Red and Blue Species: There are no threatened or endangered species in or adjacent to marine areas in this unit.

Fish Rivers: This unit contains 10 known fish bearing rivers

Salmon Bearing Rivers: There are twenty-three known salmon bearing rivers in this system. Thirteen are moderately important coho and chum rivers. These rivers include Pack Lake, Driftwood, Chief Nowley, Jap, Rainbow, Waamtx, Waump, Warner Bay , Taaltz, Lassiter and Rowley Creeks and the Seymour and Quashella Rivers. The majority of these are located in Belize Inlet, Alison and Mereworth Sound.

Human Resource Use

Biophysical Capability for Salmonid Farming. Approximately 85% of this planning unit is capable of supporting finfish farms. About 21% of the total area is rated medium and good capability. Schooner Channel has a good capability rating. Outer Belize Inlet and Outer Nugent Sound have a medium capability rating. The majority (64%) of the area has a limited capability rating.

Commercial Groundfish Fishery (Clam). Commercial clam harvesting in this unit occurs at the head of Salmon Arm, the head of Alison Sound, in Lassiter Bay and in bays in Mereworth Sound.

Commercial Groundfish Fishery (Crab). Crabs are also harvested commercially at Lassiter Bay, the head of Alison Sound, Strachan Bay, the heads of Seymour Inlet and Frederick Sound.

Commercial Groundfish Fishery (Finfish). Commercial groundfishing areas of moderate use are found in outer Seymour and Belize Inlets, in Schooner Channel, the mouth of Nugent Sound, Slingsby Channel, Mignon Point and Harriet Point to Charlotte Bay in Seymour Channel. The are also similar use areas at the head of the inlets with similar usage at the entrance of Mereworth Sound, Alison Sound and Fredrick Sound.

Commercial Prawn/Shrimp Fishery. Commercial prawn fishing activity also occurs in Lassiter Bay, Alison and Mereworth Sounds, as well as Belize Inlet, McKinnon and Nenahlma Lagoons, Maunsell Bay and near the head of Seymour Inlet and Wigwam Bay.

Tenures There is a single Goal 1 site at Cape Caution, and a single Goal 2 site at Seymour Estuary.

Archaeological Sites: This unit contains 33 archaeological sites

Tourism

Boating Use Areas: None identified

Marine Routes: All but Nugent Sound

Potential Marine Routes: None identified

Kayak Routes: None identified

Potential Kayak Routes: None identified

Features: More than 20 sites in the marine with more on terrestrial areas. Includes boating, anchorages, grizzly viewing, fishing, fish viewing, trails, camping, kayaking, and beaches.

Facilities: Composed of a resort in Warner Bay and a site at the mouth of Nugent Sound

C13 - Queen Charlotte Strait

Physical and Oceanographic Description:

This planning unit extends from the mouth of Slingsby Channel southwest to include Storm Islets and Price Islands, and extends southeast through Gordon Channel to Donegal Head on Malcolm Island. It also includes Pierce and Plumper Islands and all of the western islets of the Broughton Archipelago. It runs along the outer shoreline of the mainland coast back to Slingby Channel. Seasonal changes of oxygen levels, which reach their minimum in autumn, are brought about by Queen Charlotte Sound bottom water spilling over the entrance sill 140 m below the surface. The eastern part of Queen Charlotte Strait likely has two periods of slight dilution during mid-summer (Knight - Kingcome Inlet influence) and early winter. The winter winds can generate 3 metre waves against an incoming Pacific swell. The northeast shore of Queen Charlotte Strait is all but uninhabited. Despite the indented coastline, most bays open either to the northwest or southeast and there is very little shelter except in shallow areas. The water structures of the large Bradley and Shelter Bay lagoons are not known except that they are likely anoxic at depth, possibly relic, and there is likely a fresh water layer on their surface.

Biological Resource Values

Birds: This area supports high concentrations of bald eagles. The northern portions support populations of several loon species. The most important waterbird area is the Storm Islets, which support populations of harlequin ducks. Areas of moderate importance include Blunden Harbour (diving ducks), Staples Island (harlequin ducks), Ommaney Islets (harlequin ducks), Twin Islets (harlequin ducks), and Ledge Rock (harlequin ducks). The primary black oystercatcher colony is found on the Storm Islands. There are numerous less important oystercatcher colonies throughout the area. Large concentrations of rhinoceros auklets are found at the head of Queen Charlotte Strait in summer. Alcids are found in large numbers at Storm Islets (pigeon guillemots, Cassin's auklets, rhinoceros auklets, tufted puffins), Pine Island (pigeon guillemots, rhinoceros auklets, Cassin's auklets), and the Buckle Group (pigeon guillemots, Cassin's auklets). Nawitte Bank supports large concentrations of gull species, while the Storm Islets support glaucous winged gull and pelagic cormorant colonies, and Rogers Island supports glaucous winged gull colonies. Sooty shearwaters are found on Nawitte Bank in the northern parts of Queen Charlotte Strait. The Storm Islands and Buckle Group support populations of fork-tailed storm petrels and Least's storm petrels. Red-necked phalaropes are found on the Walker Group, the Buckle Group, and Pine Island.

Marine Mammals: Habitat capability is medium for Grey and Humpback whales. The rating is high in this unit for harbour porpoises, Pacific White-sided dolphins, and Dall's porpoises. Seals in this area haulout at Surge Islets, Penfold Islands, East Tree Islets and Deserters and Walker Groups. The Millar group and Harris Island are the site of significant sealion haulouts. Generally, this entire unit has a high capability rating for Orcas with the most important area including the western Broughton Archipelago to Foster Island, and south Deserters and Walker Groups.

Marine Fish: Herring spawn in this unit occurs in Shelter Bay. According to CHS chart data, medium importance marine plants occur in Blunden Harbour, around Storms Islets, and in patches in outer Broughton Archipelago. There are seasonal concentrations of dogfish.

Red and Blue Species: There are three blue listed sites, four yellow listed sites, and one unranked site in Queen Charlotte Strait.

Fish Rivers: This unit contains two known fish bearing rivers

Salmon Bearing Rivers: There are five known salmon bearing rivers in this system. Of these, the Cohoe River near Blunden Harbour has a modest runs of pink and coho.

Human Resource Use

Biophysical Capability for Salmonid Farming. There are five active tenures for salmon farming in this unit. Approximately 20% of this planning unit is capable of supporting finfish farms. About 10% of the total area is rated medium capability, which is concentrated in the Walker and Deserters Groups and Outer Broughton Archipelago.

Biophysical Capability for Shellfish Farming. Little more than 1% of the total area has a good or medium oyster capability rating. This area is Booker Lagoon and the area along the south side of Eden Island. Roughly 1% of the total unit area has a medium scallop capability, in the waterways southwest of Eden Island.

Commercial Groundfish Fishery (Crab). Blunden Harbour is the site for commercial crab harvest in this unit.

Commercial Groundfish Fishery (Clam). Clams are harvested commercially from various bays in and around Broughton Archipelago, Booker Lagoon, Walker Group, Blunden Harbour (at the entrance to Bradley Lagoon), and Alison Harbour.

Commercial Groundfish Fishery (Finfish). This is an important area for commercial groundfishing, particularly rockfish and Halibut. High use areas include; Schooner Channel to Storm Island, Bright Island, Kent Island, Numas Island, Deserters and Millar Group. Notable, but less significant areas include Raynor Group, Foster Island and Stubbs Island to Double Bay on Plumper Island.

Commercial Red and Green Sea Urchin Fishery. Significant commercial sea urchin harvesting occurs around the small islands north west of Hanson Island (Pearse, Weyto, Ksuilads Islands).

Commercial Salmon Net Fishery. About 50% of this area is used by the net fishery. The main area includes all of DFO Subarea 12-3 with localized fishing concentrations. Up to 300 boats gillnets and seiners fish throughout this area with the heaviest concentrations in mid Johnstone Strait. Major gillnet anchoring occurs in Boat and Foreward Bays. In Queen Charlotte St. north of Malcolm Island: (mainly DFO Subareas 12-6,-8,-9,-10,-16), up to 80 boats fish for mainly sockeye, pink and chum species. Off Round Island south of Hardy Bay and the region between Dillon and Malcolm Pt, up to 80 boats fish mainly sockeye and pink, with some chum. Timing depends on Nimpkish sockeye. Intensity depends on Fraser River sockeye diversion for both these areas.

In Clio Channel and Blackfish Sound (DFO Subarea 12-5), up to 100 boats fish for sockeye, pink, chum. From DFO Subarea 12-6 and west are mainly fished for chum. In the area outside Beaver Cove and Lewis Point to Donegal Head (Subarea 12-18, and Subarea 12-4) up to 50 boats fish for sockeye, pink, chum. On the north shore of Hanson Island, in Freshwater Bay, and Swanson-Cedar Islands on the Marine Park boundary, 100 boats fish for sockeye, pink, and chum with the heaviest fishing recorded at Double Bay and Bold Head.

Commercial Salmon Hook and Line Fishery. For the troll fleet, the area bounded by Deserters Group, Blunden Harbour and Shelter Inlet (DFO statistical area 12-13), is a significant fishing area for chinook, coho and sockeye. Within this area there are localized important areas off Blunden Harbour, Stuart Point, Millar Island, and Deserters and Walker Groups.

Queen Charlotte Strait and Blackfish Sound are moderately important for sockeye and pink, with locally important troll fishing areas near Hansen Island and the mouth of Fife Sound.

In the area bounded by the Deserters and Walker group of Islands, Blunden Harbour and Shelter Inlet (DFO Statistical area 12-13) is a significant area for the salmon Troll fleet for chinook, coho and some sockeye with very important local areas near Blunden Harbour to Stuart Point and off Millar and Deserters-Walker group of Islands. Lesser but large areas of use from Queen Charlotte Strait through Blackfish Sound for pink and sockeye with localized very important areas near Hansen Island and the mouth of Fife Sound.

Sport Salmon, Groundfish, Crab, Clams and Shrimp Fishery. The groundfish sport fishery is focused around the island groups in middle of Queen Charlotte Strait, the most significant of which is Numas Island. The Buckle Group, Deserters Group, Joan Island and Kent Island are notable but less significant areas.

Sport Salmon, Groundfish, Crab, Clams and Shrimp Fishery. Significant sportfishing for salmon occurs in Richards Channel, Blunden Harbour, Deserters Group, Gordon Channel, Wells Passage, Eden Island in Fife Sound, Mars Island, Arrow Passage near Bonwick, north of Malcolm Island, George Passage north-east of Malcolm Island, Freshwater Bay, Stubbs Island and Pearse Island.

Tenures Goal 1 sites occur in the Duke of Edinburgh Extension, Cape Caution, Deserters and Walker Groups, and the Broughton Archipelago Extension. Goal 2 sites are found at Barry Islet, Numas Islands, Polkinghorn, and Cullen Harbour.

Archaeological Sites: This unit contains 32 archaeological sites

Tourism

Boating Use Areas: None identified

Marine Routes: In many areas

Potential Marine Routes: None identified

Kayak Routes: None identified

Potential Kayak Routes: None identified

Features: Thirty-one features identified

Facilities: A single site on Bramhan Island

C14 - Kingcome Inlet

Physical and Oceanographic Description

This unit extends from the mouth of Wells Passage and includes Drury Inlet, MacKenzie and Greenway Sounds, Sutlej Channel to Shawl Bay, Wakeman Sound and Kingcome Inlet. Drury Inlet is a low runoff fjord. A tidal jet inflow (310 to 400 cm/ at Stuart Narrows) apparently creates a nearly homogenous water column. Reported summer values for surface water are 9.5° C and 30 ppt salinity. Associated oxygen levels range from 12.5 to 6.6 mg/l. Kingcome and Wakeman form a high runoff system which drains mountain ice cap terrain. Wakeman Sound is subject to vigorous polar outflow winds while winds in Kingcome inlet are somewhat decreased. The wave climate is quite severe as waves can reach 120 cm high during polar outflows, and there is an unrelenting chop in the summer. Wakeman Sound has a large area of winter freeze over. Records show late spring glacial silt-laden, dilute water of 3m thickness extending from the head of these inlets to lower Kingcome while the semi-dilute layer extends to the 4 m depth throughout the inlet. The silt plume usually settles out after exiting from Penphrase Passage to Tribune Channel. From summer to winter, temperatures ranging from 15°C to 5°C are found at the 2 to 5 meters depth. Oxygen levels are likely to reach supersaturation above the halocline in summer, but in winter the 2 to 5 m values are lower. A relatively vigorous estuarine outflow in the surface layer generates net velocity in the order of 10 cm /sec.

The Mackenzie Sound Region includes the waterways to the north of Wells Passage and Sutlej Channel including Mackenzie Sound, Grappler Sound, Kenneth Passage, Hopetown Passage and Nepah Lagoon. There are no major freshwater river drainages into the system. Notable are the strong tidal currents that flow around Watson Island.

Most of these regions are moderate to shallow embayments with the exception of Nepah Lagoon which is a deep basin greater than 100 meters and which is entered by Roaring Hole Rapids. During tidal exchanges this narrow passageway may produce rapids and waves greater than 1 meter in height.

Biological Resource Values

Birds: There are moderately important waterbird areas in Drury Inlet (surf scoters, diving ducks), Mackenzie Sound (surf scoters, unidentified goldeneye species, dabbling ducks), Wakham Sound (mallards, Canada geese, brant geese, unidentified goldeneye species), and Kingcome River estuary (western grebes, common mergansers, and Canada geese). Large concentrations of rhinoceros auklets are found at the head of Queen Charlotte Strait in summer.

Marine Fish: Considerable low intensity herring spawn occurs near Watson Island and in Kingcome Inlet.

Marine Mammals: Humpback whales, harbour porpoises and Pacific White-sided dolphins have a medium habitat capability rating for this unit.

Red and Blue Species: There are no threatened or endangered species in or adjacent marine areas in this unit.

Fish Rivers: This unit contains 11 known fish bearing rivers

Salmon Bearing Rivers: There are nineteen known salmon bearing rivers in this system. Of these Embley Creek and Kingcome and Wakeman River have very significant runs of pink, coho, chinook, chum and sockeye. Claydon Bay, Kenneth Passage, and various bays on the east side of Broughton Island. Bughouse, Phyliss, Carriden, Charles, Nimmo, Marion and Sullivan Bay Creeks are all moderately significant mainly for coho and pink salmon. Mackenzie Sound Creek also has a moderately significant sockeye run.

Human Resource Use

Biophysical Capability for Salmonid Farming. There are six active finfish farm sites within this planning unit. Approximately 48% of this planning unit is capable of supporting finfish farms. About 27% of the total area is rated medium or good capability. Outer Drury Inlet is rated good. Wells Passage and waterways north of Broughton Island have a medium rating.

Biophysical Capability for Shellfish Farming. A good or medium oyster capability rating for this unit appears in approximately 32% of the total area. Drury Inlet, Mackenzie Sound and the waterways of Broughton Island all have a rating of good. Roughly 21% of the total unit area has medium or good scallop capability. This area is generally the same as those with good oyster capability with the exception that upper Drury Inlet is rated medium rather than good scallop capability.

Commercial Groundfish Fishery (Clam). Clams are harvested commercially from Tracy Harbour, bays in Drury Inlet, MacKenzie Sound,

Commercial Groundfish Fishery (Crab). Commercial crab harvesting occurs in Collinson Bay, Cypress Harbour, Broughton Lagoon, the head of Drury Inlet, and to the west of Watson Island.

Commercial Prawn/Shrimp Fishery. The commercial prawn fishery in this area occurs in MacKenzie Sound, Grappler Sound, Wells Passage, Sutlej Channel, Greenway Sound, Kingcome Inlet, south Wakeman Sound, Belleisle Sound, and a small area within Drury Inlet.

Tenures Goal 2 sites are found in Wakeman Estuary, Kingcome Estuary and Cullen Harbour.

Archaeological Sites: This unit contains 56 archaeological sites

Tourism

Boating Use Areas: None identified

Marine Routes: 3-4 in Kingcome Inlet

Potential Marine Routes: None identified

Kayak Routes: None identified

Potential Kayak Routes: None identified

Features: Approximately 30 sites identified consisting primarily of anchorages, crabbing and boating

Facilities: Approximately 10 in Sullivan Bay, Jennis Bay, Greenway Sound, Nimmo Bay, and several other areas

C15 - Broughton

Physical and Oceanographic Description

This large planning unit is divided into two general areas.

A) Southern Broughton Archipelago from Fife Sound and Penphrase Passage in the north to Call Inlet in the south. This area includes six major islands, Gilford, Turnour Island, East and West Cracroft, Harbledown and Hanson Island. In addition the archipelago also includes over 70 smaller islands and islets which separate the waters of Queen Charlotte Strait and those of the mainland inlets forming a variety of shoals along the western edge of the region. The major inlet systems which influence the area with freshwater intrusions include Knight Inlet, Kingcome Inlet, Thompson Sound and Wakeman Sound. Call Inlet, Bond Sound, Mackenzie Sound and Drury Inlet represent smaller systems which have a reduced effect on the estuarine circulation of the region on a seasonal basis.
The winds over the Broughton Group are influenced by those of Queen Charlotte Strait. Prevailing winds are generated by the pressure systems of the open Pacific and determined locally by mountainous terrain of the mainland coast. These winds are predominately easterly in the winter months and westerly during the winter. Strong outflow winds (gales to storm force) along the major inlets occur during the winter when arctic air approaches the coast from the northeast. In summer, westerly winds will typically build to gale force (30 knots) in the afternoon as heated mainland air rises, drawing cooler air from across Queen Charlotte Strait. Wave heights are generally constricted by local limitations in fetch within the Broughton Group, however, the entrance to Knight Inlet, south of Gilford Island, does provide the westerly fetch necessary to produce wind-induced waves of 1-2 meters in height. The outer edge of the Broughton Group can produce extreme and dangerous sea waves when westerly winds and ebbing tides occur across this shallow area.
Tidal fluctuations are higher than in the Strait of Georgia, with mean low and high tides at 3.1 and 14.7 feet (0.9 and 4.5 m) respectively and extremes of 0.7 and 19.3 ft (-0.2 and 5.9 m) . Generally beaches are non-estuarine and are formed from sand/mud/shell substrates.

B) The western portion of Johnstone Strait, from Havanna channel to Sunderland Channel, is a relatively deep, steep sided reach. Surface currents are strong, ranging from 50-150 cm/s. The waterway is well mixed with very localised dilution near the river mouths. In summer, surface and deeper salinity ranges from 30.7 to 30.9 ppt and in winter from 30 to 30.1 ppt. Summer temperatures range from 9.7 -10.1°C and winter temperatures are nearer to 7.7°C. The beach substrates consist of either rock/cobble/gravel or mud/sand. The eastern portion from Sunderland Channel to Edith Point is also cold and well mixed. Surface tidal currents are quite strong and a large fetch creates choppy waters during easterlies or westerlies. Summer salinities range from 29.6 to 31.2 ppt and winter salinities range from 29.1 to 29.9 ppt. Summer surface temperatures range from 9.4°C to 11.3°C and are around 7.7 °C in winter. Both these waterways are subject to very heavy marine traffic and most protected bays serve as anchorages. Large log storage facilities, wharves and an outfall are located in the Kelsey Bay and Salmon Bay area near the western entrance. Also in this planning unit are a series of channels connecting the mainland inlets with Johnstone Strait, Sunderland, Chancellor, Nodales, and Okisollo Channels, Mayne Passage, Topaze Harbour, Forward Harbor, Loughborough and Bute Inlet and Fredrick and Phillips Arm. Each of these channels and embayments have unique oceanographic conditions which result from a combination of depth, exposure, runoff and current effects. In general the channels experience moderate to strong surface currents and are well mixed. With embayments and narrow inlets, particularly those with shallow sills, circulation is more restricted and there may be an accumulation of debris in back eddies. The most significant input of freshwater in the area is Bute Inlet. Phillips Arm and Loughborough Inlet are classed as intermediate runoff fjords. Loughborough has significant spring freshwater inflow but lacks sufficient glacier melt to act as a stored runoff system. Inner Loughborough is subject to modified polar outflow winds during the winter. Bute Inlet is a steep-sided, high runoff fjord with cold diluted, turbid glacier runoff throughout the summer. There is a good estuarine circulation as a result. Surface salinities at the head range from 0.1 - 2 ppt, whereas at the mouth salinity ranges from 5 -20 ppt with a usual dilute (<15 ppt) surface layer 5-10 m thick. Internal waves at depth and the surface are frequent. The waterway is subject to strong polar outflow winds in winter which can produce very rough seas and icing conditions. Summer surface salinities range from 4.9 to 27.3 ppt and temperatures from 10.2 °C to 16.6 °C. In winter surface salinities range from 25.7 to 27.4 ppt and temperature ranges from 6.1°C -6.9 °C.

Biological Resource Values

Birds: Important waterbird areas include Port Neville (bufflehead ducks, mallards, swans, unidentified scaup species, American widgeons, unidentified scoter species), and Blenkinsop (green winged teals, mallards, red-breasted mergansers, red-necked grebes, swans). Moderately important waterbird areas include Health Bay (unidentified goldeneye species, mallards, American widgeons), Maple Cove (unidentified goldeneye species), Bond Sound (unidentified goldeneye species, dabbling ducks), Thompson Sound (dabbling ducks, diving ducks), Chatham Channel (diving ducks), Broken Islands (harlequin ducks), Seymor Island (harlequin ducks), Topaz Harbour (unidentified scaup species, unidentified scoter species, western grebes, dabbling ducks), the head of Loughbourogh Inlet (mallards), and Phillips Arm (western grebes). Large concentrations of rhinoceros auklets are found at the head of Queen Charlotte Strait in summer. The area also supports high concentrations of bald eagles.

Marine Fish: The east side of Gilford Island, Broughton Archipelago, Clio Channel and Thompson Sound are areas of low intensity herring spawn.

Marine Mammals: Pacific White-sided dolphins have a high habitat capability rating, while Humpback whales have a medium rating for this unit. Generally, this entire unit has a high capability rating for Orcas with the most important areas including Swanson and Hansen Islands and Johnstone Strait to Forward Bay on West Cracroft Island.

Marine Plants: According to CHS chart data, marine plant clusters appear in outer Clio Channel, however, they have a low importance rating.

Red and Blue Species: There are no threatened or endangered species in or adjacent marine areas in this unit.

Fish Rivers: This unit contains 20 known fish bearing rivers

Salmon Bearing Rivers There are forty-two known salmon bearing rivers in this system. Of these nine have very significant runs of pink, chum, coho, sockeye and chinook salmon. These include the Phillips, Stafford, Kakweiken and Ahta Rivers and Read, Wortley, Viner Sound, Heydon and Scott Cove Creeks. Thirteen rivers have moderately significant runs of mainly coho and pink salmon. These include Christie, Cameleon Harbour, Call, Gilford, Fraser Bay, Grassy, Gray, Fanny Bay, McAlister and Shoal Harbour Creeks and the Tuna and Fulmore Rivers.

Human Resource Use

Biophysical Capability for Salmonid Farming There are forty-one active tenures for salmon farming in this unit. Approximately 27% of this planning unit is capable of supporting finfish farms. About 22% of the total area is rated medium capability, distributed throughout the Broughton Archipelago..

Biophysical Capability for Shellfish Farming. There are four active tenures for shellfish farming in this unit. A good or medium oyster capability rating for this unit appears in approximately 23% of the total area. The distribution of these sites is throughout all of the inlets. Roughly 11% of the total unit area has medium or good scallop capability in sheltered inlets, such as Clio, Barnet and Call Inlets and in McKenzie Sound.

Commercial Groundfish Fishery (Crab). Crabs are harvested commercially at Hanson Island, Gilford Island, Port Elizabeth to Lady Douglas Island, Call Inlet and Beware Passage.

Commercial Groundfish Fishery (Clam). The commercial clam fishery in this planning unit occurs in Cameleon Harbour, the heads of Hemming Bay and Forward Harbour, and various bays in and around the Broughton Archipelago

Commercial Prawn/Shrimp Fishery. Prawns are harvested commercially at Penphase, Rayleigh, Hornet Pass, Tribune Channel, Misty Passage, Bond and Thompson Sounds, Call Inlet, Knight Inlet from Minstrel Island to Matsui Bay, Clio Channel, Chancellor and Loughborough Channels, the entrance of Bute Inlet, and Cordero Channel.

Commercial Red and Green Sea Urchin Fishery Significant commercial sea urchin harvesting occurs along Wellborne Channel on east Hardwicke Island and west Thurlow Island at Greene Point Rapids and south Erasmus Island..

Commercial Salmon Net Fishery. Local areas in Tribune and Bond Channels, (Part of Subarea 12-35) are periodically used by up to 20 seine boats to fish pink salmon (even year Kakweikan stock). The main areas include all of DFO Subarea 12-3, (from Hansen to the east side of Cracroft Island,), which is used by both the gillnet fleet (Up to 300 boats) and Seine fleet (up to 250 boats) to fish for sockeye, pink, and chum. Gillnet fleets fish throughout the area, with the heaviest use in mid Johnstone Strait. Boat and Foreward Bays are major anchorage sites for gillneters. In all of Subarea 12-1, (Havanna Channel to Blenkinsop Bay) up to 200 gillnet boats, and up to 100 seine boats, fish for sockeye, pink, and chum. The important gillnet and seine fishing areas for sockeye, pink and chum extend eastward from Sunderland Channel, the length of Johnstone Strait, within this planning area.

Appendix IV: Coastal Planning Unit Descriptions

Commercial Salmon Hook and Line Fishery. The salmon troll fleet has many important uses throughout this unit. All of Fife Sound and Tribune Channel are important areas for even year Kakweiken pink salmon. All of Johnstone Strait is an important area for sockeye, pink and chum with some incidental coho and chinook. In addition Deepwater Bay, Okisollo and Frederick Arm to Calm Channel and Stuart Island are also important areas.

Sport Salmon, Groundfish, Crab, Clams and Shrimp Fishery. The sport fishery for ground fish is widely distributed throughout the Broughton Archipelago but generally focused in island clusters, such as the Fox, Indian, Eden and Lady Island Groups, with other general areas such as Clio Channel and Call Inlet. The most important areas are outer Fife Sound near Eden Island, and for rockfish specifically Quadra Island/Discovery Pass and Stuart Island.

Commercial Groundfish Fishery (Finfish). The commercial fishery for groundfish (rockfish and Halibut) occurs primarily in the southern portion of this planning unit. There is one small but important area at Parson Island in Blackfish Sound. The remaining important areas are Helmcken Island, Ripple Shoal, northern Johnstone Strait from West Thurlow Island and Nodales and Cordero Channel, and the heavily fished Discovery Passage/Okisollo Channel and west Stuart Island.

Sport Salmon, Groundfish, Crab, Clams and Shrimp Fishery. Significant sportfishing for salmon and groundfish throughout this planning unit occurs in Shawl, Salmon, and Hayle Bays in Broughton Island, Viner Sound in Gilford Island, Pearse Peninsula, Eden island, Fife Sound, Ragged Island, Davies Island, Fife Sound, Tramford Point on Gilford Island, Mars Island, Fox group, Baker Island, Cleave Point, Arrow Passage, Bonwick Island, Cordero/Chancellor Sargeaunt Passage, Viscount Island in Knight Inlet, Tribune Point in Knight Inlet, Tsakonu Cove, Call Inlet, White Nob Point, Freshwater Bay, Batt Bluff, Swanson Island, Stubbs Island, Clio Channel, Blackfish Sound south of Swanson Island, Blackney Passage, Hanson Island, Cracroft Point, Sophia Islands, Forward Bay in Johnstone Strait, Arran Rapids, Sunderland/Chancellor/ Wellbore, Arran Rapids exit, Helmcken Island, Kelsey Bay, Davis Point, Howe Island, Stuart Island up Bute Inlet to Lawrence Point.

Tenures Goal 1 sites in the Broughton Extension and the Ahnuhati Complex. Goal 2 sites include the Burdwood Group, Boat Bay, Yorke Island, Forward Harbour, Thruston Bay, Phillips Estuary, and Stafford Estuary.

Archaeological Sites: This unit contains 181 archaeological sites

Tourism

Boating Use Areas: None identified

Marine Routes: In most areas

Potential Marine Routes: None identified

Kayak Routes: None identified

Potential Kayak Routes: None identified

Features: Distributed throughout unit, but concentrations in the northwest sections, near Gilford Island and near the Broughton Archipelago

Facilities: Approximately 32 sites clustered in Farewell Harbour, Health Bay, Echo Bay, Chinook Cove, Bones Bay, Port Neville, Jackson, Shoal Bay, Blind Channel, Sonora Island and Owen Bay

C16 - Knight Inlet

Physical and Oceanographic Description

This unit includes all of Knight Inlet from approximately Protection Point east. Generally regarded as the most spectacular fjord in the southwestern sector of the province, Knight Inlet is characterized as a high run-off fjord. The waterway is fed by the Glaciers of Mount Waddington and Mount Silverthrone icecap. Glacial water extends throughout the lower portions of the fjord during summer months. The lower salinity waters may reach depths of 5 meters. Polar outflow events channel through the lower reaches of Knight Inlet during which time waves may exceed 3 metres. Westerly winds during summer months may also produce significant wind waves. Nearshore depths are greater than 100 meters. Knight Inlet is subject to pronounced internal gravity waves caused by ebb flow over sill of Hoeya Head.

Biological Resource Values

Birds: Moderately important waterbird areas include Siwash Bay (unidentified goldeneye species, mallards), Kwalate Creek (surf scoters), and the head of Knight Inlet (unidentified goldeneye species).

Marine Fish: Significant herring spawn occurs at the head of Knight Inlet, with high intensity in some areas.

Marine Mammals: Humpback whales, Harbour porpoises and Pacific White-sided dolphins have a high habitat capability rating for this unit.

Red and Blue Species: There are no threatened or endangered species in or adjacent to marine areas in this unit.

Fish Rivers: This unit contains 11 known fish bearing rivers

Salmon Bearing Rivers: There are twelve known salmon bearing rivers in this system. Of these Glendale and the Ahnuhati River have very significant runs that include all commercial salmon species and Nigger Creek for pink salmon. Lull, Kwalate, Matsiu and Hoeya Sound Creeks and the Klinaklini River all have moderately significant largely pink salmon runs.

Human Resource Use

Biophysical Capability for Salmonid Farming. Approximately 16% of this planning unit is capable of supporting finfish farms. The whole of this 'capable' area is rated as limited capability.

Commercial Prawn/Shrimp Fishery. The entire western segment of Knight Inlet, and the area along the shoreline from Glendale to the head of Knight Inlet is the site of a commercial prawn fishery in this area.

Commercial Groundfish Fishery (Crab). Crabs are harvested commercially from Hoeya Sound, and all of the north-south aligned sections of Knight Inlet including Glendale Cove.

Commercial Salmon Net Fishery. The main species fished in this area are pink salmon from the Glendale and Ahnuhati runs. The most significant fishing grounds include part of DFO Subarea 12-26, all of DFO Subareas 12-27, -28, -29 for pink salmon (Glendale "even year" stock). The entrance to Glendale Cove, Sallie Pt. to Naena Point, and Hoeya Sound are all significant pink salmon fishing areas (Ahnuhati pink stock).

Sport Salmon, Groundfish, Crab, Clams and Shrimp Fishery. The sport fishery for ground fish is in the general area of Siwash Bay in Knight Inlet.

Commercial Groundfish Fishery (Finfish). There is a moderately important commercial rockfish fishery area in Hoeya Sound.

Tenures The only Goal 1 site is the Ahnuhati Complex, and the single Goal 2 site is Klinaklini Estuary.

Archaeological Sites: This unit contains 16 archaeological sites

Tourism

Boating Use Areas: None identified

Marine Routes: None identified

Potential Marine Routes: None identified

Kayak Routes: None identified

Potential Kayak Routes: None identified

Features: Approximately 22 sites

Facilities: Approximately five sites throughout the area

Glossary

Biochemical oxygen demand: the combined oxygen consumption in water from suspended micro-organisms and the decay of organic molecules.

Chelator: a molecule which binds to metal ions typically reducing their toxicity.

Diurnal: daily, an action that occurs approximately every 24 hours

Fetch: the length of open water over which wind can act upon to generate waves.

Halocline: the depth in the water column where there is a rapid change in salinity , generally the depth which separates lower salinity surface water from deeper more saline water. This along with the thermocline gives information on water column stability.

Humic stained water: water that is coloured from passing through earth

IHN virus: Infectious Haematopoietic Necrosis an acute systemic disease of sockeye and chinook salmon, initially the disease affects the blood-forming tissues of the kidney.

Internal gravity waves: a wave whose speed is controlled by gravity (greater than 1.7 cm in length) and occurring where there is a sharp change in salinity, temperature or density within the water column.

O_2 saturation: the level of dissolved oxygen concentration in water can range from anoxic (zero) to saturation; the maximum concentration of oxygen that can be dissolved in water. This value varies with temperature, salinity and barometric pressure.

Polar outflow conditions: a condition in which cold air flows from interior plateaus or mountain ranges down through troughs to coastal inlets They can generate high wind, waves and freezing spray.

ppt: parts per thousand units. Used in measuring the salinity of seawater, weight of salt (grams) /weight of water (kilogram)

PSP: paralytic shellfish poison

SEP facilities: Salmon Enhancement Program facilities

Sill: shallow portion of the ocean floor which partially restricts water flow at the mouth of an inlet.

Thermocline: the depth in the water column where there is a rapid change in water temperature a strong thermocline generally means that surface waters are not mixing with underlying colder water.

Tidal jets: occurs where water movement from tidal currents is forced over a shallow sill or through a narrows. A tidal jet can form in which current speed can reach several hundred cm/s. This generally results in well mixed and oxygenated water near the sill or narrows.

Tsunamis: a wave which may be 10 metres or more in height and is caused by a sub-oceanic earthquake.

Turbidity plumes: an area, usually extending from the heads of inlet, where water clarity is conspicuously reduced by suspend matter such a glacial till.

Williwaws: a sudden, isolated violent wind squall occurring as cold mountain air falls over steep mountain slopes.